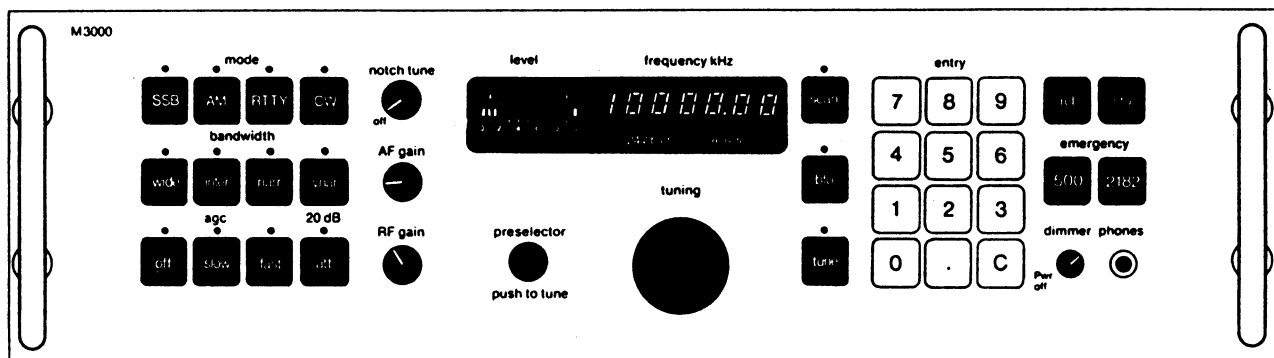


OPERATING AND SERVICE MANUAL

M 3000

COMMUNICATION RECEIVER



WARNING

To prevent potential fire or shock hazard, do not expose receiver to rain or moisture.

Manual part no. 458651

ALL RIGHTS RESERVED.

NO PART OF THIS MANUAL MAY BE REPRODUCED BY ANY METHOD OR MANNER, NOR TRANSMITTED, NOR TRANSLATED INTO A MACHINE LANGUAGE WITHOUT THE SPECIFIC WRITTEN AUTHORIZATION OF DANSK RADIO AS.

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The information given in this manual at the time of publication is valid. However, the products are, as a consequence of DANSK RADIO's continuous research and development, subject to alteration without obligation of prior notice.

Dansk Radio AS



dra

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SAFETY SUMMARY

The following general safety precautions must be observed during all phases of operation, service, and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the equipment. Dansk Radio AS assumes no liability for the customer's failure to comply with these requirements.

GROUND THE EQUIPMENT

To minimize shock hazard, the equipment chassis and cabinet must be connected to an electrical ground. The equipment is equipped with a three-conductor ac power socket. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the equipment in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must not remove equipment covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

SAFETY SUMMARY (continued)

DO NOT SERVICE OR ADJUST ALONE

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the equipment.

DANGEROUS PROCEDURE WARNINGS

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

WARNING

Dangerous voltages, capable of causing death, are present in this equipment. Use extreme caution when handling, testing, and adjusting.

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SECTION 1

GENERAL INFORMATION

1.1 Introduction.

This Operating and Service Manual contains information required to install, operate, test, adjust and service the receiver. A separate Operators Guide is also supplied. It should be kept with the receiver for use by the operator.

1.2 Specifications

Receiver specifications are listed in table 1.1. These specifications are the performance standards or limits against which the receiver is tested. Table 1.2 lists supplemental characteristics. Supplemental characteristics are not specifications but are typical characteristics included as additional information for the user.

1.3 Receivers covered by this Manual

This manual applies to receivers with serial number included in the list on the title page.

Due to the experience obtained from the production and operation of the equipment, minor differences between the receiver and the manual can occur. Wherever possible such differences are covered in a "MANUAL CHANGES"

supplement, which also contains the documentation concerning the actual options in your receiver.

1.4 Safety Considerations

This manual contains information, cautions and warnings which must be followed to ensure safe operation and to maintain the receiver in a safe condition.

1.5 Description

The communication receiver is a fully synthesized, dual conversion, superheterodyne receiver. It covers the frequency range 100 kHz to 29.99999 MHz in 10 Hz increments (optionally down to 15 kHz). Operation modes are AM, CW, RTTY and SSB.

The receiver is equipped with microprocessor control. This provides intelligence in the form of factory programmed instruction memory that introduces new concepts in communication receivers, providing improvements in performance, ease of operation and reliability.

The microprocessor control includes features such as:

- Instant push-button tuning
- Free tuning in 10 Hz to 1 kHz steps depending on the rotation speed of the tuning knob
- Battery back-up memory storage for 75 user programmable frequencies and reception modes (incl. BFO-tuning)
- Automatic receiver setting on the distress frequencies 500 kHz and 2182 kHz
- Automatic selection of all CCIR recommended frequencies for SSB and RTTY communication
- Digital keyed AGC
- AGC hold-time synchronized with SIMPLEX or ARQ burst keying
- Scanning of user-selected and CCIR frequencies
- Built-in diagnostic routines
- Error conditions automatically displayed on front panel
- AGC threshold control
- Prepared for digital selcall (option)
- Fully remote-controlled (option)

The receiver controls are arranged in groups enabling the operator to easily identify and control receiver operation with a minimum of switching. Standard settings of the AGC and bandwidth controls are automatically selected when the operator presses the desired reception mode. The operator can override all preset settings and select AGC time

constants and receiver bandwidths more suitable for his reception environment.

The receiver is equipped with a floating inverter circuit enabling the receiver to be powered either from 110/220Vac mains or 24Vdc battery.

If powered from both mains and battery, the receiver automatically selects the mains supply when available. Only during mains drop-out the battery supply will be drained.

During supply drop-out the receiver settings as well as the information contained in the user programmed memory storage is energized from a built-in battery back-up. When the drop-out is terminated, the receiver settings are automatically recalled to the front panel.

The receiver incorporates scanning facilities. During scanning the dwell time between channels is programmed by means of the normal frequency entry keyboard. Via the control input/output socket (at the rear panel of the receiver) the scan sequence may be temporarily terminated from an auxiliary decoder, enabling automatic reception of selcall communication.

When the receiver is set to the AGC-mode, the manual RF-control may be used as an AGC threshold control.

When the receiving signal exceeds the threshold level the AGC circuit in

the receiver is operated. At the same instant a digital ON signal is available at the control input/output socket, permitting external recording facilities, e.g. telex terminals or tape recorders, to be started.

A detailed operating instruction is contained in section 3 of this manual.

1.6 Options

The following options extend the usefulness of the receiver :

Option 001: Suboctave Filters replacing the manually tunable preselector. For a fully remote controlled receiver this option must be included.

Option 003: Duplex Filters included on the preselector board to improve reception when the receiver is used in the DUPLEX mode.

Option 004: RTTY Demodulator featuring adaptive threshold control, RS232C output and strappable baudrate and mark/space frequencies.

Option 005: Oven Stabilized Reference Oscillator for high stability reception purposes.

1.7 Accessories Supplied

The following accessories are supplied with the receiver :

One Operating and Service Manual
One Operators Guide

1.8 Accessories Available

The following items are available for use with the receiver :

Receiver Cabinet, DRA part no. 453684

Rack Slides Kit, DRA part no. 458872

Connector Kit, DRA part no. 457914

Standard Spare Parts Kit, DRA part no. 458880

Depot Spare Parts Kit, DRA part no. 458899

Special Tools Kit, DRA part no. 458902

Table 1.1 Specifications

The below stated specifications are valid only when measured in accordance with the performance test procedures specified for M3000.

FREQUENCY RANGE

100 kHz to 30 MHz in 10 Hz increments. (15 kHz to 100 kHz with reduced performance).

OPERATING MODES

A1A, A2B, H2A, A3E, H3E, R3E, J3E and F1B.

FREQUENCY STABILITY (Standard version)

1 ppm 0°C to 40°C
 2 ppm -15°C to $+55^{\circ}\text{C}$
 aging < 1 ppm/year

ANTENNA IMPEDANCE (Standard version)

Below 1.6 MHz : 10 Ω in series with 220 pF to 560 pF.
 1.6 MHz to 4 MHz : 10 Ω in series with 250 pF
 Above 4 MHz : 50 Ω .

INPUT PROTECTION

50V EMF for up to 15 minutes.

IF SELECTIVITY

R3E, J3E : Passband ripple < 2 dB
 Relative att. < 6 dB within 350 Hz to 2.7 kHz
 Stopband att. > 60 dB at -400 Hz and 3.7 kHz.

A1A, A2B, H2A, A3E, H3E, F1B :

Wide	:	-6 dB at \pm 2.7 kHz
Inter	:	-6 dB at \pm 1.2 kHz
Narrow	:	-6 dB at \pm 0.5 kHz
Very narrow	:	-6 dB at \pm 0.1 kHz

Table 1.1 Specifications (Continued)

SENSITIVITY (Standard version)

0.1 MHz to 1.6 MHz : 4 μ V EMF for 10 dB SINAD in A1/Narrow
18 μ V EMF for 10 dB SINAD in A2, A2H, A3,
A3H/Inter

1.6 MHz to 4 MHz : 2 μ V EMF for 20 dB SINAD in A3A, A3J
8 μ V EMF for 20 dB SINAD in A2, A2H, A3,
A3H/Wide

4 MHz to 30 MHz : 2 μ V EMF for 20 dB SINAD in A2A, A3J
8 μ V EMF for 20 dB SINAD in A2, A2H, A3,
A3H/Wide

INTERMODULATION (Out-of-band)

100 dB μ V EMF per signal more than 30 kHz offset from tune frequency produces less than an equivalent input signal of 40 dB μ V EMF.

CROSS MODULATION

With a wanted J3E signal of 60 dB μ V EMF, an unwanted signal of 110 dB μ V EMF/30% - 400 Hz produces cross modulation output less than -30 dB relative to wanted signal level.

BLOCKING

With a wanted signal of 60 dB μ V EMF, an unwanted signal of 110 dB μ V EMF causes less than 3 dB change in output level.

ADJACENT SIGNAL SELECTIVITY

With a wanted J3E signal at the specified sensitivity limit, an unwanted signal of 80 dB μ V EMF offset -5 kHz/+8 kHz from tune frequency causes less than 6 dB change in SINAD.

IMAGE REJECTION

Greater than 90 dB.

IF REJECTION

Greater than 90 dB.

Table 1.1 Specifications (Continued)

SPURIOUS RESPONSE REJECTION

Greater than 80 dB

INTERNALLY GENERATED SPURIOUS RESPONSE

Internally generated spurious signals will not produce a S/N ratio greater than 10 dB (Inter).

SPURIOUS EMISSION

Less than 40 dB μ V/50 Ω at antenna connector.

RF ATTENUATOR

0 dB or 20 dB.

AUTOMATIC GAIN CONTROL

Less than 4 dB change in output for 100dB input signal variation from specified sensitivity limit.

Time constants A1A, R3E, J3E, F1B

Attack time : 0.5 msec. for 70 dB signal increase.

Debounce time : 5 msec.

Attack-to-hold time :

Wide : 25 msec.

Inter : 30 msec.

Narr : 50 msec.

Vnarr : 60 msec.

Hold time :

Short : 30 msec.

Long : 1 sec.

Decay time : Typical 20 dB per 100 msec.

Time constants A2B, H2A, A3G, H3E : 200 msec.

BFO RANGE

+ 7 kHz synthesized in 10 Hz steps.

Table 1.1 Specifications (Continued)

NOTCH TUNE

Typical 30 dB variable from 300 Hz to 2700 Hz.

IF OUTPUT

-20 dB/50 Ω .

LINE OUTPUT

Level : Adjustable up to +10 dBm

Impedance : 600 Ω balanced, return loss better than 20 dB

Distortion : Less than 1% in J3E

LINE INTERMODULATION (In-band)

Less than -25 dB relative to either of two 90 dB μ V EMF signals
(With RF Attenuator in "OFF").

SIDE TONE INPUT

Max. 500 mV/600 Ω

MONITOR OUTPUT

Speaker : 4W/4 Ω

Phones : 10 mW/500 Ω

MUTING

Attenuation : 60 dB typical

Attack time : 0.1 msec. typical

Decay time : 0.5 msec. typical

INPUT POWER

24 Vdc +30/-10%, 85W

110/220 Vac \pm 10%, 50/60 Hz, 65VA

OPERATING ENVIRONMENT

Temperature : Full performance range 0°C to 50°C

Operating range -15°C to 55°C

Humidity : To 95% relative humidity at 40°C

Table 1.1 Specifications (Continued)

Vibration : Vibration in three planes for 30 min. each
with 1 G acceleration, 5 to 50 Hz

WEIGHT

15 kg.

DIMENSIONS

See outline drawing (table 1.2).

Table 1.2 Supplemental Characteristics

FREQUENCY TUNING

Numerical frequency keyboard entry plus single knob tuning.

75 user programmable channels including mode settings.

176 pre-programmed CCIR-SSB channels.

257 pre-programmed CCIR-RTTY channels.

FREQUENCY TUNE TIME

Typical 10 msec.

BFO TUNING

Numerical frequency keyboard entry plus single knob tuning.

Default values automatically recalled when selecting reception modes.

BFO TUNE TIME

Less than 1 msec.

DISTRESS RECEPTION

500 kHz and 2182 kHz with automatic receiver settings.

INPUT SELECTIVITY (Standard version)

Tuneable preselector.

PRESELECTOR NOISE GENERATOR

Built-in noise generator for optimum preselector tuning.

AGC SYNCHRONIZATION

The AGC control is synchronized with the mute command.

AGC THRESHOLD CONTROL

Threshold continuously variable.

Table 1.2 Supplemental Characteristics (Continued)

USER PROGRAMMABLE CHANNELS

Number of channels : 75
Channel information : Receive frequency, reception mode, bandwidth, AGC-setting, RF attenuator, and BFO frequency.
Data storage time : Longer than 5 years.

SCANNING

Scanning of user programmed channels and CCIR channels.
Scan mode : Automatically or manually by tune knob.
Dwell time : 0.1 to 9 sec. selected by keyboard entry.
Scan control : By scan stop (remote or manually) and AGC level.

SIGNAL DELAY

Signal delay from antenna input to line output :

Wide - 0.45 msec.
Inter - 0.85 msec.
Narr - 0.85 msec.
Vnar - 3.0 msec.

DIMMER CONTROL

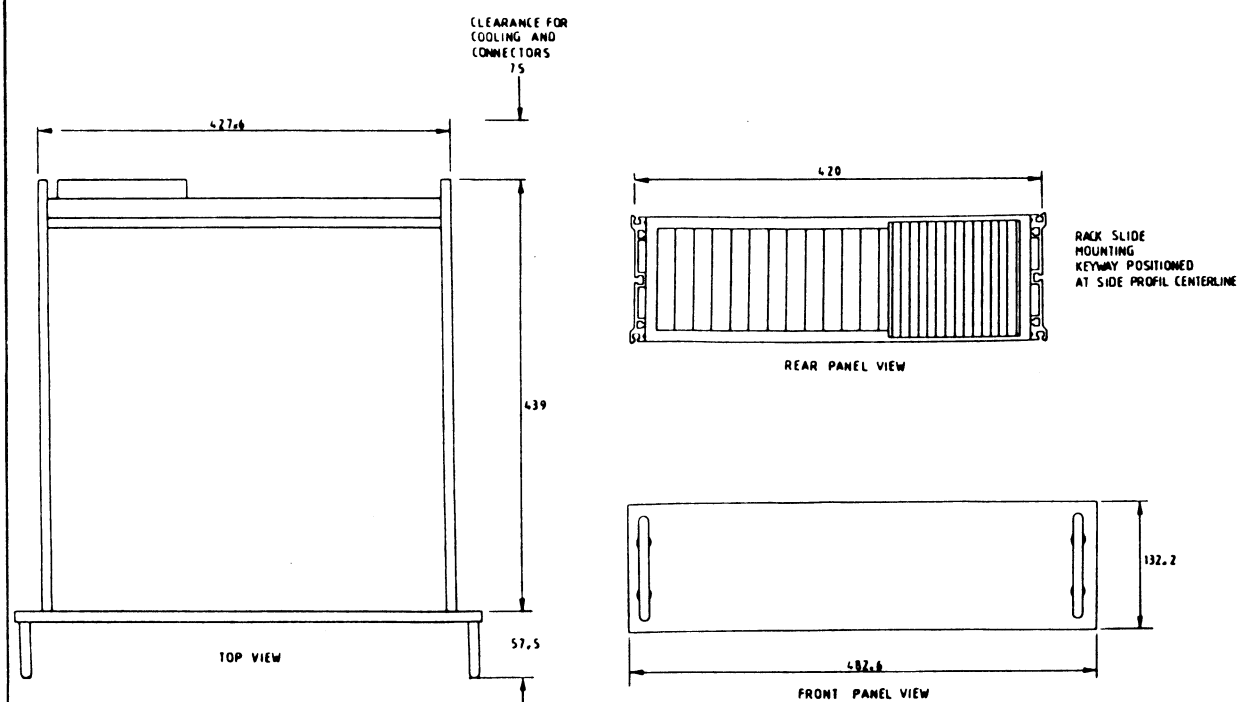
Continuously variable.

AUTO RESTART

Retention of receiver settings during power failure.

Table 1.2 Supplemental Characteristics (Continued)

RECEIVER DIMENSION



RECEIVER CABINET (Not included in normal delivery)

Height : 159 mm
 Width : 509 mm
 Depth : 463 mm

SECTION 2 INSTALLATION

2.1 Introduction

This section of the manual provides installation instructions for the communication receiver. It also includes information about initial inspection and damage claims, preparation for use and repacking for shipment information.

2.2 Initial Inspection

WARNING

To avoid hazardous electrical shock, do not perform electrical tests when there are signs of shipping damage to any portion of the front or rear panel or outer covers. Read the safety summary at the front of this manual before installing or operating the receiver.

Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, it should be kept until the contents of the shipment has been checked for completeness and the receiver has been checked mechanically and electrically. Contents of the shipment should be as listed in the "Equipment Supplied" paragraph in Section 1. If the contents are incomplete, if there is mechanical

damage or defect, or if the receiver does not pass the performance tests, notify the nearest Dansk Radio agent. If the shipping container is damaged, or if the cushioning material shows sign of stress, notify the carrier as well as the Dansk Radio agent.

A full report of the damage should also be forwarded to Dansk Radio.

Include the following:

- Order number
- Model and serial number
- Name of transportation agency

2.3 Storage

The receiver may be stored or shipped in temperatures within the limits -40°C to $+75^{\circ}\text{C}$. It is advisable to protect the receiver from extreme temperature variation which can cause excessive condensation.

2.4 Repacking for shipment

The shipping container for the receiver has been carefully designed to protect the receiver and its accessories during shipment. This container and its associated packing material should be used when repacking for shipment. If shipping to Dansk Radio for service, attach

a tag indicating the type of service required, return address, model number and full serial number. Mark the container FRAGILE to ensure careful handling.

If the original shipping container is not available, the following general instructions should be used for repacking with commercially available materials:

- Wrap the receiver in heavy paper or plastic. If shipping to Dansk Radio for service, attach a tag indicating the type of service required, return address, model number and full serial number
- Use a strong shipping container eg. a double walled carton of 160 kg test material
- Protect the control panel with cardboard and insert a 7 to 10 cm layer of shock absorbing material between all surfaces of the equipment and the sides of the container
- Seal the shipping container securely
- Mark the shipping container FRAGILE to ensure careful handling

2.5 Mounting information

The receiver may be conveniently mounted in a standard 19 inch rack using a pair of rack slides or chassis angles appropriate for the rack system. The receiver in the rack mounted configuration, requires a standard panel space 5.25 inches high.

The receiver may also be mounted in a cabinet for bench operation, part no. 453684. The cabinet is designed to be mounted on a table or on a shelf, fast-

ened to the support by means of four bolts.

When operating the receiver, provide at least 75 mm clearance at the rear and at least 7 mm on all sides of the receiver. Failure to allow adequate air circulation will result in excessive internal temperature, reducing receiver reliability.

2.6 Power Requirements

The M3000 receiver requires a power source of 110Vac ($\pm 10\%$) or 220Vac ($\pm 10\%$) 50-60 Hz single phase or 24Vdc ($\pm 30\%$ to -10%).

The maximum power consumption is approximately 85W

CAUTION

The receiver is normally set at the factory for 220Vac and 24Vdc operation.

The selection of 110 or 220 volt nominal mains voltage is made by changing connections on terminal strip A10A2TB1 on the power supply assembly A10. To change the mains voltage setting proceed as follows: refer to Figure 2.1 and 2.5)

- a. Disconnect the input power cord from the receiver
- b. Disconnect the regulation transistor cable from A10J2 and remove the power supply heat sink panel by removing the four retaining screws at the rear end of the receiver side profiles.

- c. Remove the eight screws positioned at the edge of the power supply rear panel A10 and withdraw the power supply assembly.
- d. Change connections on terminal strip A10A2TB1 to 110V or 220V as appropriate in accordance with Figure 2.1. The terminal strip is situated in the power supply assembly behind the rear panel.

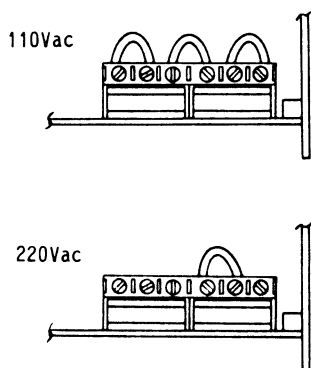


Figure 2.1
Mains Voltage Selection

- e. Reposition the power supply assembly in the receiver
- f. Reposition the power supply heat sink panel and connect the regulation transistor cable to A10J2
- g. Connect the input power cord to the receiver

The receiver is equipped with a floating inverter circuit enabling 24Vdc battery supply. If the receiver does not operate when connected to the D.C. supply, check the polarity of the D.C. (The inverter incorporates reverse polarity protection).

Both 220/110Vac and 24Vdc power sources may be connected to the receiver at the same time. When operated from two power sources the receiver automatically selects the mains power source when available. During line power drop-outs the receiver selects the 24Vdc source.

2.7 Fuses

The power source fuses depend on the supply voltage selected. Table 2.1 provides the ratings and Dansk Radio part numbers of suitable fuses.

Table 2.1 Fuse Ratings

Fuse	Voltage	Fuse Rating	DRA part no.
F1	110 Vac	2A Timed	262714
F1	220 Vac	1A Timed	262706
F2	24 Vdc	6.3 Timed	394629

2.8 Power Cable

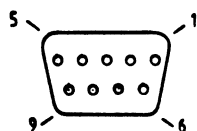
In accordance with international safety standards this receiver is equipped with a three terminal power connector. When connected with an appropriate power cable the receiver cabinet should be grounded via the power connector center tap.

If the power cable is terminated with a mains plug, this should only be inserted in a socket outlet provided with a protective earth contact. The protective action must not be negated by the use of a power cable without a protective conductor (grounding).

2.9 Audio Input/Output

The audio input/output socket A10J3 (refer to Figure 2.5) provides loudspeaker output and sidetone input (later used during simplex A1 keying).

The audio input/output socket connections are as follows:



Key

- | | | |
|-----|--------------------|--------------------------|
| 1 | Sidetone input | } 100-500 mV
600 ohms |
| 2 | Sidetone GND | |
| 4-8 | Loudspeaker output | } 4W
4 ohms |
| 5-9 | Loudspeaker GND | |

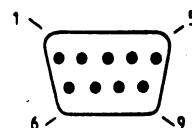
Figure 2.2 Audio Input/Output Socket as Viewed on Rear Panel

The appropriate cable connector may be ordered from Dansk Radio as part of the Connector Kit, part no. 457914.

2.10 Line Output

The line output plug A7J4 (refer to Figure 2.5) provides AF line output for auxiliary equipment. The line out-

put level may be adjusted from the A7 back panel to a level between +10dBm and -20dBm/600 ohms. The line output plug connections are as follows:



Key

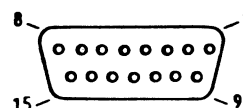
- | | | |
|---|----------------------|--------------------------------|
| 1 | Line GND | } -20 to
+10dBm
600 ohms |
| 2 | Line output bal. | |
| 3 | Line bal. center tap | |
| 4 | Line output bal. | |

Figure 2.3 Line Output Plug as Viewed on Rear Panel

The appropriate cable connector may be ordered from Dansk Radio as part of the Connector Kit, part no. 457914

2.11 Control Input/Output

The control input/output socket A8J1 (refer to Figure 2.5) provides all digital controls to and from the receiver. The socket connections are as follows:



Key

- | | |
|---|----------------|
| 1 | RS 232 input |
| 2 | RS 232 in. GND |
| 3 | Mute input (-) |
| 4 | Mute input (+) |

- 5 Duplex input (-) } Optional
- 6 Duplex input (+) }
- 7 Scan Stop input (-)
- 8 Scan Stop input (+)
- 9 RS 232 Output
- 10 RS 232 out.GND

Figure 2.4 Control Input/Output
Socket as Viewed on Rear Panel

All control inputs are floating and exercised by 24Vdc/10mA positive logic.

The appropriate cable connector may be ordered from Dansk Radio as part of the Connector Kit, part no. 457914 .

2.12 IF Output

The receiver is equipped with a 1.4 MHz IF output socket (BNC) providing

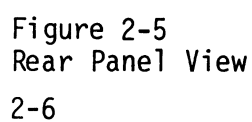
a -20 dBm/50 ohm 2nd IF signal for auxiliary equipment. (Refer to Figure 2.5). The output signal is bandwidth filtered in accordance with the receiver bandwidth setting.

2.13 Antenna Input

The antenna input, socket A4J1 (BNC), is protected against 30Vrms/continuous and 50Vrms/15 minutes burn-out. The antenna input impedance is as stated in the relevant specifications in section 1. (Refer to Figure 2.5).

2.14 Installation Check-out

When the installation is complete refer to section 3 (OPERATION) and fully check the operation of the receiver.



SECTION 3 OPERATION

3.1 Introduction

This section of the manual contains instructions for proper operation of the M3000 communication receiver.

Frequency 2182 kHz
Mode AM
Bandwidth wide
AGC slow
Antenna attenuator off

3.2 Panel features

Figure 3.1 identifies and describes the functions of the front panel controls, indicators and connectors.

NOTE

1. If the display reads OSC.FAIL, the frequency synthesis circuits are not operating properly.
2. If Ann.FAIL (nn is a two-digit number) momentarily appears in the display after turn-on, some of the initial test indicate a failure. Refer to Section 8, Service, for failure identification.
3. If either of the above conditions occurs, refer the receiver to qualified service personnel for repair.

3.3 Power/Warm-up

The model M3000 requires a power source of 110 or 220Vac, single phase, or 24 Vdc. The selection of power source and phases is described in Section 2, Installation.

The M3000 power switch has two positions, OFF and ON. Power is applied to some circuits at any time the receiver is connected to the power source.

If the receiver has the Oven Assembly Option installed, it is important that it remains connected to the power source to maintain a constant oven temperature, eliminating the need for a long warm-up period.

3.4 Initial conditions

After the power has been switched on, the receiver status will be as follows:

3.5 Self Test

The self test operation is initiated by pressing the C key, then the tune key. The self test is then carried out by the built-in microprocessor by means of a ROM-based diagnostic program package.

Press the C key again to leave the self test program.

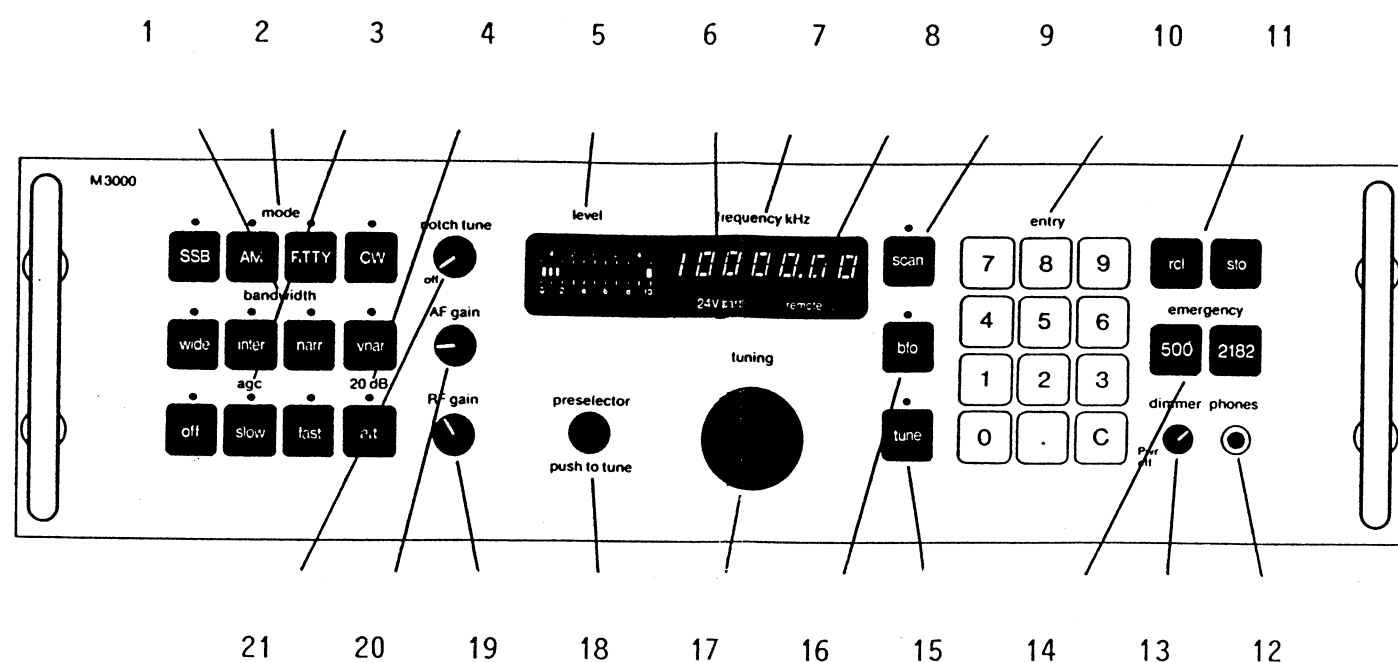


Figure 3.1 Front Panel Features

- 1 BANDWIDTH group. These keys select the IF-bandwidth when the receiver is operated in AM-or CW mode.
- 2 MODE group. These are the primary mode selection keys for reception. Pressing any mode key automatically selects default values for the secondary keys.
- 3 AGC control group. These keys select the proper AGC time constants. These constants are also affected by the MODE keys. In the "off" mode, RF-gain is manually controlled.
- 4 ATTENUATOR key. Inserts a 20 dB attenuator in the receiver front end. Used to further improve the receivers large-signal response.
- 5 S-METER. Analog indication of the received signal strength.
- 6 POWER SOURCE annunciator. Indicates that the receiver is powered from + 24 Vdc.
- 7 ALPHANUMERIC display. Displays the receiving frequency, the BFO-frequency, error codes, and failure modes.
- 8 REMOTE annunciator. Indicates that the receiver is remotely controlled by a master.
- 9 SCAN key. Selects the automatic- and the manual scanning mode.
- 10 ENTRY group. This group includes the numeric data keys, and the clear key.
- 11 REGISTER group. These keys are used for storing and recalling user-programmed receiver settings. The recall key is also used for selection of international communication channels.
- 12 PHONES output. Connection for headphones. Disconnects the local speaker.
- 13 DIMMER/POWER control. Used for control of the light intensity in the front panel indicators. In the OFF position, power is only applied to the oven (optional) and to part of the power supply circuits.
- 14 DISTRESS keys. Used for quick-setting of the receiver on the two international distress frequencies. See paragraphs 3.7.1 and 3.9.4 for further information.
- 15 TUNE key. Enables/disables free-tuning by the control knob.
- 16 BFO key. Enables/disables the BFO control mode.
- 17 TUNING control. Used for free-tuning of the receiving frequency and the BFO-frequency.
- 18 PRESELECTOR control. Tuning control of the input filters. Pressing the preselector knob activates a built-in noise generator for easy adjustment of the filters.
- 19 RF-GAIN/SQUELCH control. Used during AGC "off" to manually adjust the intermediate frequency gain. Used in the squelch mode to control the AGC-threshold.
- 20 AF-GAIN control. Manual adjustment of the audio frequency gain.
- 21 NOTCH-TUNE control. Manual adjustment of an audio frequency notch filter, tunable in the range 300 Hz to 3000 Hz. Used to attenuate undesired interfering signals in the audio output.

3.6 Manual operating instructions

The following paragraphs describe the procedures for operating the receiver from the front panel.

They explain how to set the frequency, mode and special function controls, and cover operating instructions for standard and distress operating modes.

3.6.1 Clear display

Pressing **[C]** key clears the display to zero. This key is useful when an error is made while entering data.

3.6.2 Entry errors

The word "Error" will appear in the display for approximately one second when an error in programming the receiver occurs. The incorrect entry will not be accepted. Table 3.1 shows the relevant entry error-codes and their explanation.

Table 3.1 Entry errors

Error code	Message
02	User register not defined
03	Invalid user register
04	Invalid international channel
05	Invalid scan sequence
06	Scan channel not defined

3.7 Quick reference operating instructions

3.7.1 500 kHz and 2,182 kHz operation

- Press **[500]** or **[2182]**
- Press PRESELECTOR and adjust for max. meter reading
- Adjust AF-GAIN for a convenient volume

3.7.2 AM operation

- Key in the desired frequency
- Press the **[AM]** key
- Press PRESELECTOR and adjust for max. meter reading
- Adjust AF-GAIN for convenient volume

3.7.3 SSB, CW and RTTY operation

- Key in the desired frequency
- Press **[SSB]** (once or twice to select USB or LSB), **[CW]** or **[RTTY]**
- Press PRESELECTOR and adjust for maximum meter reading
- Adjust AF-GAIN for a convenient volume

3.8 Frequency Control

The frequency resolution can be set by the operator to 1kHz, 100 Hz or 10 Hz by pressing **[.]** an appropriate number of times.

3.8.1 Keyed Tuning

Key in the desired frequency by pressing numbers in sequence, just as they are written on a piece of paper.

The display immediately shows the number sequency in right entry display format, i.e. the numbers appear in the rightmost display character and are shifted left one character on each number entry. The decimal point must be keyed if it is part of the number (unless it is to be right of the last frequency digit in kHz).

For example to key in 7501.65 kHz, simply press the following keys in sequence,

Press	Display
<u>C</u>	0.00
<u>7</u>	7.00
<u>5</u>	75.00
<u>0</u>	750.00
<u>1</u>	7501.00
<u>.</u>	7501.00
<u>6</u>	7501.60
<u>5</u>	7501.65

3.8.2 Free tuning

The tuning control is activated by pressing tune. A light above the key indicates the free tuning function. By rotating the tuning knob the receiving frequency is varied in quasi-continuous steps.

Pressing tune the second time disables the free tuning.

3.9 Function keys

The receiver has a number of function keys that allow the operator to select operating modes.

NOTE

A lighted indicator above any key denotes it as an active entry. For example, if the "wide" key indicator is on, it is not necessary to press that key if this is the desired bandwidth.

3.9.1 Reception mode

The receiver can operate in four modes:

AM, SSB, CW and RTTY

The proper mode is selected by pressing one or twice one of the keys labelled AM, SSB, CW, or RTTY.

Pressing a mode key automatically selects default values for secondary control keys. However, these default settings can be altered by the operator by manual entry after the mode selection.

The following default settings are used:

AM - AGC (slow), Bandwidth (wide)
 SSB - AGC (slow), Bandwidth <disabled>
 CW - AGC (slow), Bandwidth (narr)
 RTTY - AGC (slow), Bandwidth (narr)

3.9.2 AGC control

The AGC keys control the AGC time constants. Press any of the keys labelled off, slow or fast to select the desired mode.

In the AGC "off" mode the gain can be adjusted by means of the RF-GAIN control knob.

NOTE

The MODE keys will affect the time constants of the AGC - circuit. The AGC control keys are used for supplementary control of the AGC time constants. For further information refer to the receiver specifications.

3.9.3 Bandwidth control

The bandwidth keys **wide** , **inter** , **narr** and **vnar** select the IF bandwidth of the receiver. These keys can only be used in the AM, RTTY and CW reception modes, and will not respond to commands when the receiver is operated in SSB mode.

3.9.4 Distress keys

The two keys labelled **500** and **2182** permit quick-setting, easy-to-use reception on the two international distress frequencies. Pressing any one of these keys is accompanied by the following default setting:

500 kHz - AM, AGC (slow), Bandwidth (wide)
2182 kHz - AM, AGC (slow), Bandwidth (wide)

3.10 Storing and recalling receiver settings

The receiver contains 75 addressable storage registers that allow the operator to manually store and recall complete receiver settings.

The storage registers are part of a CMOS memory in the microcomputer and maintain their contents even though the receiver is turned off or disconnected from the power sources.

When the receiver restarts after a power failure the setting will be the same as that present before the failure occurred.

When the receiver is turned on by means of the power-switch on the front panel, it will automatically start on 2.182 kHz.

The user-programmable storage registers are indicated by the numbers .00 through .75.

3.10.1 Storing receiver settings

To store a complete receiver setting,

- Press **sto**
- Press the decimal point **.**
- Press the number keys of the applicable register address (00 through 75).

3.10.2 Recalling receiver settings

Receiver settings are recalled from storage registers in much the same way they are stored. To recall a complete receiver setting,

- Press **rc1**
- Press the decimal point **.**
- Press the number keys of the applicable register address (00 through 75).

3.10.3 Using the Rø register

The Rø register always contains the present receiver setting except any free-tuned frequency offset.

After a free-tuning sequence, simply press **[rc1] [0] [0]** (or **[rc1] [.] [0] [0]**) to restore the original frequency setting. If, after a re-adjustment, the operator wants to update the receiver setting to reflect the current receiving frequency, he should press **[sto] [0] [0]** (or **[sto] [.] [0] [0]**).

3.11 Automatic channel selection

The receiver contains information on all CCIR recommended frequencies for

- Voice duplex communication in the maritime frequency bands 4, 6, 8, 12, 16 and 22 MHz.
- Telex communication in the maritime frequency bands 4, 6, 8, 12, 16 and 22 MHz.

3.11.1 Channel selection

To select an international channel,

- Press **[SSB]** or **[RTTY]** to select desired mode
- Press **[rc1]**
- Press the number keys of the applicable channel number

The receiver will automatically generate all settings for that particular channel.

3.11.2 International calling channels

To select an international calling channel for SSB communication

- Press **[SSB]**
- Press **[rc1]**
- Press the number of the applicable maritime frequency band (4, 6, 8, 12, 16 or 22).
- Press the decimal point **[.]**

The automatic channel selection function does not occupy any space in the addressable storage registers (this feature corresponds to 433 pre-programmed channels).

An attempt to select an invalid channel number will cause an "Error" condition to be flagged on the display.

3.11.3 Optional customer-defined channels

The receiver can optionally be configured with customer-defined frequencies.

3.12 Automatic scanning

The receiver is equipped with an automatic scanning function that allows the operator to scan a number of selected frequencies.

Scanning can be out in any of the maritime frequency bands or in the user programmable storage registers.

3.12.1 Scanning international channels

To initiate a scanning sequence in one of the maritime frequency bands,

- Press **SSB** or **RTTY**
- Press **scan**
- Press the number keys of the lowest applicable channel in the sequence
- Press the number keys of the highest applicable channel in the sequence

If all channels in a frequency band are to be scanned,

- Press **SSB** or **RTTY**
- Press **scan**
- Press the number of the applicable maritime frequency band (4, 6, 8, 12, 16 or 22)
- Press the decimal point **.**

3.12.2 Scanning user-defined frequencies

To initiate a scanning sequence in the user programmable storage registers,

- Press **scan**
- Press the decimal point **.**
- Press the number keys of the lowest applicable storage register
- Press the number keys of the highest storage register

Once a scan is initiated the receiver will continue to scan from the lowest applicable channel. The display will show the settings corresponding to the current channel.

An external input signal connected to the terminal board TB1 on the micro-computer subassembly A8 can be used to interrupt the scanning sequence. The default dwell time is 9 sec.

To enter another dwell time,

- Press any of the number keys 1 through 9 to select the dwell time in seconds
- Press key 0 to select 100 msec. dwell time

3.12.3 Manual scanning

To scan a programmed sequence manually, enter a scanning sequence as described. Then

- Press **scan** again

The manual scanning mode is indicated by a blinking scan indicator.

Manual scanning is now carried out by rotating the tuning knob.

For example, to scan the SSB duplex channel in the 16 MHz band,

SSB	Select SSB mode
scan	
1	
6	Enter scan sequence
.	
scan	Enter manual mode

To leave the manual mode,

- Press **scan** to reenter automatic scan
- or
- Press **C** to leave scanning mode

NOTE

Only the keys labelled

scan , C , 500
and 2182 may be activated during scanning.

3.13 BFO control

The BFO-frequency is entered and displayed with 3-digit resolution. The frequency can be entered from the keyboard and/or tuned by the tuning control knob.

To enter the BFO-frequency from the keyboard,

- Press bfo
- Press 0 to select the proper sign. (+/-)
- Press the number keys of the applicable BFO-frequency, entering the decimal point in the proper place.

To adjust the BFO-frequency by the frequency tuning knob,

- Press bfo
- Adjust the BFO-frequency by means of the tuning knob

Pressing bfo the second time disables the BFO-control.

3.14 AGC Threshold control

The AGC threshold control may be activated when the receiver is operated in either of the two automatic gain control modes, i.e. "slow" and "fast".

- Press the key labelled slow or fast to select the desired AGC time constants.

- Press the active AGC key again to enter the threshold mode.

The threshold mode is indicated by a blinking AGC indicator. The AGC threshold is adjusted by turning the RF-GAIN.

To leave the threshold mode,

- Press the active AGC key.

The active AGC indicator will now light steadily.

If the threshold mode is used during scanning, the receiver will dwell only briefly, i.e. 100 ms, at channels with signal levels below the AGC threshold. If the signal level exceeds the threshold, the receiver dwells at the channel for the time selected with the keys 0-9 (see 3.12.2) and then continues scanning.

A RS232C compatible output at the rear of the receiver (A8J1) indicates in positive logic receive signals exceeding the AGC threshold. This output may be used for activation of external equipment, e.g. recording devices, selective calling detectors, audio muting circuits or the output can be looped back to the scanstop input to hold the receiver frequency as long as the input signal is above threshold.

110 BAUD SERIAL CONTROL VIA A8J1.

3.15

The protocol for the serial control is as follows:

Input terminals: A8J1 - pin 1
is RS232 input

A8J1 - pin 2
is SIGNAL GND.

Data format: 110 baud asynchronous
ASCII, 7 bit
1, 1.5 or 2 stop bits,
odd parity.

Syntax: To each of the front panel keys corresponds an ASCII character. The characters must be sent to the receiver in the same sequence as the corresponding front panel keys would be used. An exception is that the TEST-program, when activated remotely, finishes without "Clear" commands.

The tuning wheel corresponds to the letters "u"=up and "d"=down.

Upon receiving data of the correct format, the receiver lights up the "remote" label on the front panel and ignores key operation. Two seconds after the last character has been received, the "remote" label is switched off and the keyboard is enabled again.

Refer to manual section 3 for detailed operation instructions.

Conversion table:

FRONT PANEL KEY = ASCII LETTER

SSB = S

AM = A

RTTY = R

CW = W

wide = w

inter = i

narr = n

vvar = v

off = o

slow = l

fast = f

att = a

scan = c

bfo = b

tune = t

9 = 9

8 = 8

7 = 7

6 = 6

5 = 5

4 = 4

3 = 3

2 = 2

1 = 1

0 = 0

comma = comma

clear = C

rc1 = r
sto = s
500 = P
2182 = D

Tune up = u
Tune down = d

NOTE:

Always start a complete set-up with "CC".
When selecting LSB or USB, always be sure
to start out in a mode different from SSB.

Example 1: Set up the receiver
at 4321.98 kHz in
mode SSB-LSB:
"ACSS4321.98".

Example 2: Set up the receiver
at 1062.00 kHz in
mode AM: "CA1062".

Example 3: Store the above set-up
in user channel No.27:
"s.27".

Example 4: Set up the receiver at
26345.70 kHz in mode RTTY:
"CR26345.70".

Example 5: Scan user channels nr.13
through 54 with a dwell time
of 2 seconds per channel:
"c.13542".

Example 6: Stop scanning at the present
channel: "C" (the next Clear
will clear the receiving
frequency to 0).

SECTION 4

Intentionally Omitted

SECTION 5

Intentionally Omitted

SECTION 6

REPLACEABLE PARTS

6.1 Introduction

This section contains information for ordering parts. Table 6.1 lists abbreviations used in the parts list, table 6.2 lists all replaceable parts in reference designator order, and table 6.3 contains names that correspond to the manufacturer's code numbers.

6.2 Abbreviations

Table 6.1 lists abbreviations used in the parts list, the schematics, and throughout the manual.

6.3 Replaceable Parts List

Table 6.2 lists replaceable parts and is organized as follows:

- a. Electrical assemblies in alpha-numerical order by reference designation.
- b. Chassis-mounted parts in alpha-numerical order by reference designation.
- c. Electrical assemblies and their components by alphanumerical order by reference designation.

The information given for each part consists of the following:

- a. Complete reference designation
- b. Dansk Radio stock number
- c. Description of part
- d. Typical manufacturer of part in identifying code
- e. Total quantity in first higher level

The total quantity in first higher level for each part is given only once - at the first appearance of the part number per lower level.

6.4 Ordering Information

To order a part listed in the replaceable parts table, quote the DRA part number, indicate the quantity required and address the order to Dansk Radio.

To order a part that is not listed in the replaceable parts list, include the receiver model number, receiver serial number, the description and function of the part, and the number of parts required. Address the order to Dansk Radio.

Table 6.1 Reference Designations and Abbreviations

REFERENCE DESIGNATIONS

A assembly
 AT .. attenuator; isolator;
 termination
 B fan; motor
 BT battery
 C capacitor
 CP coupler
 CR diode; diode
 thyristor; varactor
 DC ... directional coupler
 DL delay line
 DS annunciator;
 signaling device
 (audible or visual);
 lamp; LED

E miscellaneous
 electrical part
 F fuse
 FL filter
 H hardware
 HY circulator
 J ... electrical connector
 (stationary portion);
 jack
 K relay
 L coil; inductor
 M meter
 MP miscellaneous
 mechanical part

P ... electrical connector
 (movable portion);
 plug
 Q transistor; SCR;
 triode thyristor
 R resistor
 RT thermistor
 S switch
 T transformer
 TB terminal board
 TC thermocouple
 TP test point

U integrated circuit;
 microcircuit
 V electron tube
 VR voltage regulator;
 breakdown diode
 W cable; transmission
 path; wire
 X socket
 Y crystal unit (piezo-
 electric or quartz)
 Z ... tuned cavity; tuned
 circuit

ABBREVIATIONS

A ampere
 ac ... alternating current
 ACCESS accessory
 ADJ adjustment
 A/D ... analog-to-digital
 AF audio frequency
 AFC automatic
 frequency control
 AGC automatic gain
 control
 AL aluminum
 ALC automatic level
 control
 AM ... amplitude modula-
 tion
 AMPL amplifier
 APC automatic phase
 control
 ASSY assembly
 AUX auxiliary
 avg average
 AWG ... American wire
 gauge
 BAL balance
 BCD binary coded
 decimal
 BD board
 BE CU beryllium
 copper
 BFO beat frequency
 oscillator
 BH binder head
 BKDN breakdown
 BP bandpass
 BPF bandpass filter
 BRS brass
 BWO backward-wave
 oscillator
 CAL calibrate
 ccw ... counter-clockwise
 CER ceramic
 CHAN channel
 cm ... centimeter
 CMO ... cabinet mount only
 COAX coaxial
 COEF coefficient
 COM common
 COMP composition

COMPL complete
 CONN connector
 CP cadmium plate
 CRT ... cathode-ray tube
 CTL ... complementary
 transistor logic
 CW continuous wave
 cw clockwise
 cm ... centimeter
 D/A ... digital-to-analog
 dB decibel
 dBm ... decibel referred
 to 1 mW
 dc direct current
 deg .. degree (temperature
 interval or differ-
 ence)
 ° degree (plane
 angle)
 °C degree Celsius
 (centigrade)
 °F degree Fahrenheit
 °K degree Kelvin
 DEPC .. deposited carbon
 DET detector
 diam diameter
 DIA ... diameter (used in
 parts list)
 DIFF AMPL .. differential
 amplifier
 div division
 DPDT double-pole,
 double-throw
 DR drive
 DSB ... double sideband
 DTL ... diode transistor
 logic
 DVM ... digital voltmeter
 ECL ... emitter coupled
 logic
 EMF .. electromotive force
 EDP electronic data
 processing
 ELECT electrolytic
 ENCAP encapsulated
 EXT external
 F farad

FET field-effect
 transistor
 F/F flip-flop
 FH flat head
 FIL H fillister head
 FM ... frequency modulation
 FP front panel
 FREQ frequency
 FXD fixed
 g gram
 GE germanium
 GHz gigahertz
 GL glass
 GRD ground(ed)
 H henry
 h hour
 HET heterodyne
 HEX hexagonal
 HD head
 HDW hardware
 HF high frequency
 HG mercury
 HI high
 HPF high pass filter
 HR hour (used in
 parts list)
 HV high voltage
 Hz Hertz
 IC ... integrated circuit
 ID inside diameter
 IF intermediate
 frequency
 IMPG impregnated
 in inch
 INCD incandescent
 INCL include(s)
 INP input
 INS insulation
 INT internal
 kg kilogram
 kHz kilohertz
 k Ω kilohm
 kV kilovolt
 lb pound
 LC inductance-
 capacitance
 LED .. light-emitting diode

LF low frequency
 LG long
 LH left hand
 LIM limit
 LIN ... linear taper (used
 in parts list)
 lin linear
 LK WASH ... lock washer
 LO ... low; local oscillator
 LOG ... logarithmic taper
 (used in parts list)
 log logarithm(ic)
 LPF low pass filter
 LV low voltage
 m meter (distance)
 mA milliamper
 MAX maximum
 M Ω megohm
 MEG ... meg (10⁶) (used
 in parts list)
 MET FLM ... metal film
 MET OX .. metallic oxide
 MF ... medium frequency;
 microfarad (used in
 parts list)
 MFR manufacturer
 mg milligram
 MHz megahertz
 mH millihenry
 mho mho
 MIN minimum
 min minute (time)
 ... minute (plane
 angle)
 MINAT miniature
 mm millimeter
 MOD modulator
 MOM momentary
 MOS metal-oxide
 semiconductor
 ms millisecond
 MTG mounting
 MTR ... meter (indicating
 device)
 mV millivolt
 mVac millivolt, ac
 mVdc millivolt, dc
 mVpk millivolt, peak

Table 6.1 Reference Designations and Abbreviations (continued)

mVp-p . . . millivolt, peak-to-peak	P peak (used in parts list)	REF reference	TERM terminal
mVrms millivolt, rms	PAM pulse-amplitude modulation	REG regulated	TFT thin-film transistor
mW milliwatt	PC printed circuit	REPL replaceable	TGL toggle
MUX multiplex	PCM pulse-code modulation; pulse-count modulation	RF radio frequency	THD thread
MY mylar	PDM pulse-duration modulation	RFI radio frequency interference	THRU through
μA microampere	pF picofarad	RH round head; right hand	TI titanium
μF microfarad	PH BRZ . . . phosphor bronze	RLC resistance-inductance-capacitance	TOL tolerance
μH microhenry	PHL Phillips	RMO rack mount only	TRIM trimmer
μmho micromho	PIN positive-intrinsic-negative	rms root-mean-square	TSTR transistor
μs microsecond	PIV peak inverse voltage	RND round	TTL transistor-transistor logic
μV microvolt	pk peak	ROM read-only memory	TV television
μVac microvolt, ac	PL phase lock	R&P rack and panel	TVI television interference
μVdc microvolt, dc	PLO phase lock oscillator	RWV reverse working voltage	TWT traveling wave tube
μVpk microvolt, peak	PM phase modulation	S scattering parameter	U micro (10 ⁻⁶) (used in parts list)
μVp-p microvolt, peak-to-peak	PNP positive-negative-positive	S second (time)	UF microfarad (used in parts list)
μVrms microvolt, rms	P/O part of	" second (plane angle)	UHF ultrahigh frequency
μW microwatt	POLY polystyrene	S-B slow-blow (fuse) (used in parts list)	UNREG unregulated
nA nanoampere	PORC porcelain	SCR silicon controlled rectifier; screw	V volt
NC no connection	POS positive; position(s) (used in parts list)	SE selenium	VA voltampere
N/C normally closed	POSN position	SECT sections	Vac volts, ac
NE neon	POT potentiometer	SEMICON semiconductor	VAR variable
NEG negative	p-p peak-to-peak	SHF superhigh frequency	VCO voltage-controlled oscillator
nF nanofarad	PP peak-to-peak (used in parts list)	SI silicon	Vdc volts, dc
NI PL nickel plate	PPM pulse-position modulation	SIL silver	VDCW volts, dc, working (used in parts list)
N/O normally open	PREAMPL . . . preamplifier	SL slide	V(F) volts, filtered
NOM nominal	PRF pulse-repetition frequency	SNR signal-to-noise ratio	VFO variable-frequency oscillator
NORM normal	PRR pulse repetition rate	SPDT single-pole, double-throw	VHF very-high frequency
NPN negative-positive-negative	ps picosecond	SPG spring	Vpk volts, peak
NPO negative-positive zero (zero temperature coefficient)	PT point	SR split ring	Vp-p volts, peak-to-peak
NRFR not recommended for field replacement	PTM pulse-time modulation	SPST single-pole, single-throw	Vrms volts, rms
NSR not separately replaceable	PWM pulse-width modulation	SSB single sideband	VSWR voltage standing wave ratio
ns nanosecond	PWV peak working voltage	SST stainless steel	VTO voltage-tuned oscillator
nW nanowatt	RC resistance-capacitance	STL steel	VTVM vacuum-tube voltmeter
OBD order by description	RECT rectifier	SQ square	V(X) volts, switched
OD outside diameter		SWR standing-wave ratio	W watt
OH oval head		SYNC synchronize	W/ with
OP AMPL . . . operational amplifier		T timed (slow-blow fuse)	WIV working inverse voltage
OPT option		TA tantalum	WW wirewound
OSC oscillator		TC temperature compensating	W/O without
OX oxide		TD time delay	YIG yttrium-iron-garnet
oz ounce			Z ₀ characteristic impedance
Ω ohm			

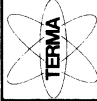
MULTIPLIERS

Abbreviation	Prefix	Multiple
T	tera	10 ¹²
G	giga	10 ⁹
M	mega	10 ⁶
k	kilo	10 ³
da	deka	10
d	deci	10 ⁻¹
c	centi	10 ⁻²
m	milli	10 ⁻³
μ	micro	10 ⁻⁶
n	nano	10 ⁻⁹
p	pico	10 ⁻¹²
f	femto	10 ⁻¹⁵
a	atto	10 ⁻¹⁸

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR448141	PWB, SYNTHESIZER	3			A1	
2	1,000	ST	60	BR455490	VCU ASSY	1			C1, C14, C27, C33, C38, C40,	
3	52,000	SI	22	BR450510	CAP. CER. 100N 63 S	4			C48, C49, C51, C52, C53, C55, C56, C58, C59, C60, C61, C62, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C90, C91, C94, C95, C96, C97, C98, C99, C100 C2, C28, C30, C35, C37, C39, C41, C42, C43, C103, C104, C105, C106, C107 C3	
4	14,000	ST	22	BR358959	CAP. CER. 1N0 100 K	4			C4	
5	1,000	ST	22	BR458457	CAP. PLST 330P 160 J	4			C5	
6	1,000	ST	22	BR359645	CAP. PLST 160P 400 F	4			C6	
7	1,000	ST	22	BR450839	CAP. PLST 560P 160 J	4			C7	
8	1,000	ST	22	BR450812	CAP. PLST 1N 160 J	4			C8	
9	1,000	ST	22	BR202991	CAP. PLST 220N 100 K	4			C9	
10	1,000	ST	22	BR357553	CAP. CER. 82P 100 C N150	4			C10	
11	1,000	ST	22	BR209554	CAP. PLST 10N 250 K	4			C11, C46, C109	
12	1,000	ST	22	BR209562	CAP. PLST 33N 250 K	4			C12	
13	3,000	ST	22	BR357502	CAP. CER. 33P 100 G N150	4			C13, C29, C36, C45, C50, C54, C57	
14	1,000	ST	22	BR450359	CAP. ELEC 1U 25 M	4			C31	
15	7,000	ST	22	BR450529	CAP. ELEC 6J8 25 M	4			C32	
16	1,000	SI	22	BR357480	CAP. CER. 22P 100 G N150	4			C34, C63, C89, C92, C93 C44, C102	
17	1,000	ST	22	BR357472	CAP. CER. 18P 100 G N150	4			C47	
18	5,000	ST	22	BR451053	CAP. ELEC 68J 6.3 M	4			CR1, CR2, CR5, CR6, CR7, CR11, CR19, CR20, CR21	
19	2,000	SI	22	BR357537	CAP. CER. 56P 100 C N150	4			CR3, CR4	
20	1,000	ST	22	BR357448	CAP. CER. 10P 100 G N150	4			C101	
21	9,000	SI	23	BR228087	DIU SIGN. 1N4148 SI 150MA	4			C108	
22	2,000	ST	23	BR480681	DIU SCHOT BAT 83 SI 60V	4				
23	1,000	ST	22	BR357405	CAP. CER. 5P6 100 C N150	4				
24	1,000	SI	22	BR459534	CAP. PLST 100N 63 M	4				



TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark

TITLE:
SYNTHESIZER A1 STANDARD

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REV: B1

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Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
25	17,000	ST	51	BR458694	SCREW M 2,5X 5 CHM CU SN	4			H1	B1
26	5,000	ST	26	BR392707	TRANS. ACCESS PAD TO-18	4			H3	
27	1,000	ST	31	BR475521	COAX CONN SMB FEM-PMB	4			J1	
28	2,000	ST	25	BR389609	COIL,CHOKE 470 K	4			L3,L4	B
29	4,000	ST	25	BR357820	COIL,CHOKE 202 K	4			L17,L18,L19,L20	B
30	1,000	ST	25	BR405493	COIL,CHOKE 0047 K	4			L5	
31	1,000	ST	25	BR393967	COIL,CHOKE 0015 K	4			L6	
32	4,000	ST	25	BR363944	COIL,CHOKE HF WIDE BAND	4			L7,L8,L9,L10	
33	4,000	ST	25	BR355933	COIL,CHOKE 608 K	4			L11,L12,L13,L15	
34	1,000	ST	25	BR372889	COIL,CHOKE 506 K	4			L14	
35	1,000	ST	25	BR394335	COIL,CHOKE 001 K	4			L16	
36	1,000	ST	41	BR460176	REAR PLATE A 1	1			MP1	
37	1,000	ST	45	BR448095	RETAINER,PC 5X5X109 MM	2			MP2	
38	2,000	ST	51	BR260819	THUMBSCREW,KNURLED M3	3			MP3	
39	8,000	ST	52	BR455571	STAY NUT M2,5X15 04,0-2,9	3			MP4	
40	1,000	ST	41	BR457612	SCREEN SHIELD A1	1			MP5	
41	1,000	ST	41	BR457604	SCREEN SHIELD A1	1			MP6	
42	1,000	ST	41	BR460273	SCREEN SHIELD A1	1			MP7	
43	1,000	ST	31	BR459364	CONTACT SPRING 2 A1-2-3-4	1			MP8	
44	10,000	ST	26	BR451320	TRANS. LOPOW 2N3906 SI-P T	4			Q1,Q2,Q4,Q8,Q10,Q13,Q19,Q36,Q37,Q38	
45	11,000	ST	26	BR455164	TRANS. LOPOW 2N3904 SI-P T	4			Q3,Q6,Q7,Q9,Q11,Q12,Q15,Q16,Q18,Q31,Q32,Q5	
46	1,000	ST	26	BR455172	TRANS..JFETN 2N3958 DUAL T	4			Q14	
47	1,000	ST	26	BR399914	TRANS..JFETN J 309 TO-92	4			Q17	
48	1,000	ST	26	BR450278	TRANS..MFETN 3N 139	4			Q20	
49	1,000	ST	26	BR274070	TRANS..JFETN BFW 11 TO-72	4			Q21,Q24,Q25	
50	3,000	ST	26	BR273899	TRANS..LOPOW BC 547B SI-N	4			Q23,Q30,Q33	
51	3,000	ST	26	BR451274	TRANS..LOPOW MPS2369 SI-N	4			Q26	
52	1,000	ST	26	BR359157	TRANS..LOPOW BC 251 SI-P T	4			Q27,Q28	
53	2,000	ST	26	BR357804	TRANS..UHF BFX 89 SI-N TO-	4			Q29	
54	1,000	ST	26	BR320668	TRANS..LOPOW BFX 48 SI-P T	4			Q34,Q39	
55	2,000	ST	26	BR389730	TRANS..JFETN J-211-18	4			Q35,Q40	
56	2,000	ST	26	BR451290	TRANS..JFETP 2N5450 TO-92	4			R1,R36,R41,R95,R118,R119,R123,R160	
57	8,000	ST	21	BR240516	RES CARB. 4K7 1/4J SFR25	4				

TERMA Elektronik AS
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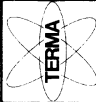
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Parts List

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PARTS LIST PER... 91/05/22

FIND NO.	QTY REQ	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
58	7,000	SI	21	BR240354	RES CARB. 510R 1/4J SFR25	4			R2,R3,R26,R38,R39,R75,R83	
59	7,000	SI	21	BR240222	RES CARB. 100R 1/4J SFR25	4			R4,R8,R10,R12,R43,R55,R73	
60	3,000	SI	21	BR240265	RES CARB. 200R 1/4J SFR25	4			R5,R24,R27	
61	2,000	SI	21	BR240397	RES CARB. 820R 1/4J SFR25	4			R6,R96	
62	2,000	SI	21	BR240125	RES CARB. 22R 1/4J SFR25	4			R7,R22	
63	2,000	SI	21	BR240605	RES CARB. 15K 1/4J SFR25	4			R9,R13	
64	7,000	SI	21	BR240443	RES CARB. 2K0 1/4J SFR25	4			R11,R52,R103,R105,R109, R120,R148	
65	1,000	SI	21	BR405590	RES FILM 619R 0,6F MRS25	4			R14	
66	2,000	SI	21	BR240583	RES CARB. 12K 1/4J SFR25	4			R15,R115	
67	3,000	SI	21	BR240451	RES CARB. 2K2 1/4J SFR25	4			R16,R28,R54	
68	9,000	SI	21	BR240184	RES CARB. 47R 1/4J SFR25	4			R17,R121,R150,R151,R152, R153,R154,R155,R161	
69	2,000	SI	21	BR240303	RES CARB. 300R 1/4J SFR25	4			R18,R60	
70	7,000	SI	21	BR240389	RES CARB. 680R 1/4J SFR25	4			R19,R29,R81,R82,R84,R87, R143	
71	3,000	SI	21	BR240486	RES CARB. 3K3 1/4J SFR25	4			R20,R23,R113	
72	6,000	SI	21	BR240567	RES CARB. 10K 1/4J SFR25	4			R21,R30,R31,R32,R65,R124	
73	10,000	SI	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R25,R53,R56,R67,R69,R77, R102,R106,R108,R127	
74	2,000	SI	21	BR240524	RES CARB. 5K6 1/4J SFR25	4			R33,R116	
75	4,000	SI	21	BR240621	RES CARB. 22K 1/4J SFR25	4			R34,R37,R40,R117	
76	1,000	SI	21	BR240427	RES CARB. 1K5 1/4J SFR25	4			R35	
77	4,000	SI	21	BR450979	RES CARB. 360R 1/4J SFR25	4			R42,R78,R80,R85	
78	2,000	SI	21	BR240419	RES CARB. 1K2 1/4J SFR25	4			R50,R125	
79	1,000	SI	21	BR372064	RES CARB. 9K1 1/4J SFR25	4			R51	
80	2,000	SI	21	BR328545	RES CARB. 220R 1/4J SFR25	4			R57,R74	
81	4,000	SI	21	BR240230	RES CARB. 120R 1/4J SFR25	4			R58,R62,R64,R162	
82	1,000	SI	21	BR240206	RES CARB. 56R 1/4J SFR25	4			R59	
83	4,000	SI	21	BR240338	RES CARB. 390R 1/4J SFR25	4			R61,R66,R79,R86	
84	2,000	SI	21	BR240192	RES CARB. 51R 1/4J SFR25	4			R63,R70	
85	4,000	SI	21	BR324205	RES CARB. 5K1 1/4J SFR25	4			R71,R110,R141,R142	
86	1,000	SI	21	BR324221	RES CARB. 2K4 1/4J SFR25	4			R72	
87	1,000	SI	21	BR362913	RES CARB. 15K 1/4J SFR25	4			R76	
88	2,000	SI	21	BR240257	RES CARB. 180R 1/4J SFR25	4			R88,R90	
89	1,000	SI	21	BR363251	RES CARB. 39R 1/4J SFR25	4			R91	

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Dansk Radio Division
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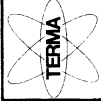
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Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
90	2,000	ST	21	BR240281	RES CARB. 270R 1/4J SFR25	4			R92,R94	
91	2,000	ST	21	BR367826	RES FILM 2K49 0,6F MRS25	4			R97,R98	
92	1,000	ST	21	BR376477	RES FILM 1K27 0,6F MRS25	4			R99	
93	1,000	ST	21	BR240311	RES CARB. 330R 1/4J SFR25	4			R100	
94	3,000	ST	21	BR240494	RES CARB. 3K9 1/4J SFR25	4			R101,R104,R107	
95	2,000	ST	21	BR324191	RES CARB. 7K5 1/4J SFR25	4			R111,R147	
96	1,000	ST	21	BR240370	RES CARB. 620R 1/4J SFR25	4			R112	
97	1,000	ST	21	BR240435	RES CARB. 1K8 1/4J SFR25	4			R114	
98	1,000	ST	21	BR240346	RES CARB. 470R 1/4J SFR25	4			R122	
99	1,000	ST	21	BR359335	RES FILM 78K7 0,6F MRS25	4			R126	
100	1,000	ST	21	BR455210	RES FILM 604K 0,6F MRS25	4			R128	
101	3,000	ST	21	BR371033	RES FILM 100R 0,6F MRS25	4			R129,R131,R136	
102	1,000	ST	21	BR376574	RES FILM 2K00 0,6F MRS25	4			R130	
103	2,000	ST	21	BR372102	RES FILM 332R 0,6F MRS25	4			R132,R135	
104	1,000	ST	21	BR458309	RES FILM 332K 0,6F MRS25	4			R133	
105	1,000	ST	21	BR359408	RES SEMIV 50K 1/2K CERM	4			R134	
106	1,000	ST	21	BR363235	RES SEMIV 5K 1/2K CERM	4			R137	
107	1,000	ST	21	BR455199	RES FILM 100K 1/4D	4			R138	
108	1,000	ST	21	BR455180	RES FILM 100R 1/4D	4			R139	
109	1,000	ST	21	BR349631	RES FILM 33K2 0,6F MRS25	4			R140	
110	2,000	ST	21	BR240680	RES CARB. 47K 1/4J SFR25	4			R144,R145	
111	1,000	ST	21	BR376361	RES FILM 825R 0,6F MRS25	4			R146	
112	3,000	ST	21	BR376531	RES FILM 511R 0,6F MRS25	4			R156,R157,R158	
113	1,000	ST	21	BR240478	RES CARB. 2K7 1/4J SFR25	4			R159	
114	12,000	ST	31	BR231304	TERMINAL STUD 2,5X7 Ø1,3	4			TP	
115	3,000	ST	24	BR451150	IC DGTL 74LS669N U/D COUN	4			U1,U2,U3	
116	6,000	ST	24	BR488089	IC DGTL 74HCT 74 2X D-FF	4			U4,U5,U6,U18,U19,U20	
117	1,000	ST	24	BR365874	IC DGTL 74LS 74N 2X D FF	4			U7	
118	2,000	ST	24	BR488690	IC DGTL 74HCT174 6X D-FF	4			U8,U9	
119	3,000	ST	24	BR490156	IC DGTL 74HCT283 4BIT ADD	4			U10,U11,U12	
120	1,000	ST	24	BR473855	IC DGTL 74LS193N U/D COUN	4			U13	
121	2,000	ST	24	BR488720	IC DGTL 74HCT193 U/D COUN	4			U14,U15	
122	2,000	ST	24	BR488011	IC DGTL 74HCT 02 4X2IN NO	4			U16,U35	
123	1,000	ST	24	BR488712	IC DGTL 74HCT192 U/D COUN	4			U17	
124	1,000	ST	24	BR404608	IC DGTL 74S 74N 2X D-FF	4			U21	
125	2,000	ST	24	BR450367	IC DGTL 10131P ECL D-FF	4			U22,U23	

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark



TITLE:
SYNTHESIZER AT STANDARD

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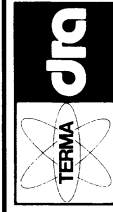
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Parts List

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PARTS LIST PER... 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
126	1,000	ST	24	BR450383	IC DGT L 10106P ECL NUR	4			U24	
127	1,000	ST	24	BR451266	IC LIN LM 301A OP.AMP.	4			U25	
128	1,000	ST	24	BR450375	IC DGT L 10116P ECL BUFFER	4			U26	
129	1,000	ST	24	BR454753	IC LIN LM 393N VOLT COMP.	4			U27	
130	1,000	ST	24	BR454745	IC LIN LM 310N OP.AMP.	4			U28	
131	1,000	ST	24	BR455113	IC LIN LM 308N OP.AMP.	4			U29	
132	1,000	ST	24	BR451282	IC LIN LF 356N OP.AMP.	4			U30	
133	1,000	ST	24	BR357898	IC DGT L 74S112 2X JK-FF	4			U31	
134	1,000	ST	24	BR451304	IC LIN LM 3046N TRANS.ARR	4			U32	
135	1,000	ST	24	BR488127	IC DGT L 74HCT138 3-8 DECD	4			U33	
136	1,000	ST	24	BR362131	IC DGT L 74 06N 6X INV-BUF	4			U34	
137	1,000	ST	24	BR451630	IC DGT L 74LS379N 4X D-FF	4			U36	
138	1,000	ST	24	BR488755	IC DGT L 74HCT365 6XBUSDR1	4			U37	
139	3,000	ST	24	BR488224	IC DGT L 74HCT377 8X D-FF	4			U38,U39,U40	
140	1,000	ST	23	BR228788	DIO ZEN ZPD1U 10V 0.5W	4			VR1	
141	2,000	ST	23	BR454389	DIO ZEN ZPD16 16V 0.5W	4			VR2,VR3	
142	5,000	ST	23	BR228850	DIO ZEN ZPD 6,2 6,2V 0,5W	4			VR4,VR5,VR6,VR7,VR8	
143	1,000	ST	37	BR458775	COAX CA ASSY - - 335MM	3			W1	
144	1,000	ST	37	BR458783	COAX CA ASSY - - 150MM	3			W2	A4
145	1,000	ST	37	BR458791	COAX CA ASSY - - 60MM	3			W3	B
146	1,000	ST	41	BR499749	SCREEN CAN ALAL MY-METAL	1				B
147	1,000	ST	21	235004-097	RES FILM 10K / 0.5 J	4			R163	
148	1,000	ST	21	235004-057	RES FILM 220R / 0.5 J	4			R164	
*****	*****	*****	*****	*****	*** BILL OF DOCUMENTATION	*****	*****	*****	*****	*****
			EB	BR448168	SYNTHESIZER A1					
			EC	BR448168	SYNTHESIZER A1					
			ND	BR448168	SYNTHESIZER A1, LOG POINT					
			PD	BR448168	SYNTHESIZER A1					
			TP	BRQA4410	SYNTHESIZER A1 RX4000					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR465429	M3000/TCKU/INCL. DUPLEX	1				

TERMA Elektronik AS
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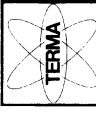
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FIND NO.	QTY ROD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	SI	37	BR452809	PWB, STANDARD USC A2	3			C1,C4,C6,C27,C30,C45,C47,C50,C52,C53,C54	
2	11,000	SI	22	BR450529	CAP. ELEC 608 25 M	4			C2 C3 C5,C11	
3	1,000	SI	22	BR450898	CAP. PLST 330N 63 J MET	4			C7,C14,C15,C20,C22,C28,C38,C44	A3
4	1,000	SI	22	BR448850	CAP. PLST 2N2 160 H	4			C35	A3
5	2,000	SI	22	BR357561	CAP. CER. 100P 100 G NPO	4			C36 C10 C12,C23,C24,C83,C84,C85	
6	8,000	SI	22	BR358959	CAP. CER. 1N0 100 K	4			C17,C21,C26,C37,C46,C49,C55,C56,C57,C58,C59,C60,C61,C62,C63,C64,C65,C66,C67,C68,C69,C70,C71,C72,C73,C75,C76	
7	1,000	SI	22	BR357480	CAP. CER. 22P 100 G N150	4			C18	
8	1,000	SI	22	BR357545	CAP. CER. 68P 100 C N150	4			C19	
9	1,000	SI	22	BR390224	CAP. CER. 470P 100 K HI-K	4			C25,C32	
10	6,000	SI	22	BR357634	CAP. CER. 2N2 100 K HI-K	4			C29	
11	27,000	SI	22	BR450510	CAP. CER. 100N 63 S	4			C31 C33 C34	
12	1,000	SI	22	BR451053	CAP. ELEC 68J 6,3 M	4			C39,C42,C43	
13	1,000	SI	22	BR357510	CAP. CER. 39P 100 G N150	4			C40 C41	
14	2,000	SI	22	BR209570	CAP. PLST 47N 250 K	4			C48	
15	1,000	SI	22	BR448885	CAP. PLST 4N7 160 H	4			C51 C74	
16	1,000	SI	22	BR448877	CAP. PLST 3N3 160 H	4			C81 C82 CR1	
17	1,000	SI	22	BR209554	CAP. PLST 10N 250 K	4			CR4,CR5,CR6,CR7,CR10,CR11,CR12,CR13,CR14	
18	1,000	SI	22	BR450804	CAP. PLST 3N 160 F	4			CR8,CR9	
19	3,000	SI	22	BR450812	CAP. PLST 1N 160 J	4				
20	1,000	SI	22	BR450820	CAP. PLST 220P 630 J	4				
21	1,000	SI	22	BR357650	CAP. CER. 22N 63 A HI-K	4				
22	1,000	SI	22	BR450839	CAP. PLST 560P 160 J	4				
23	1,000	SI	22	BR357596	CAP. CER. 150P 100 G N150	4				
24	1,000	SI	22	BR357499	CAP. CER. 27P 100 G N150	4				
25	1,000	SI	22	BR450359	CAP. ELEC 1J 25 M	4				
26	1,000	SI	22	BR459410	CAP. ELEC 10J 10 M	4				
27	1,000	SI	23	BR451061	DIO CAP.BB 405B SI 2-17PF	4				
28	9,000	SI	23	BR228087	DIO SIGN. 1N4148 SI 150MA	4				
29	2,000	SI	23	BR405531	DIO CAP.BB204B SI 37-42PF	4				

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
30	5,000	ST	51	BR458694	SCREW M 2,5X 5 GHM CU SN	4			H1	
31	2,000	ST	25	BR450065	COIL, ACCESS SCREEN, CAN	4			H2	
32	2,000	ST	31	BR475521	COAX CONN SMB FEM-PMB	4			J1, J2	
33	1,000	ST	31	BR477052	CONN MOLEX 6P MALE	4			J3	
34	1,000	ST	25	BR454524	COIL M 3000 A2 L1	1			L1	
35	2,000	ST	25	BR450405	COIL, CHOKE 0068 K	4			L2, L3	
36	3,000	ST	25	BR394343	COIL, CHOKE 100 K	4			L4, L8, L9	
37	2,000	ST	25	BR363294	COIL, CHOKE 47J J	4			L5, L17	
38	2,000	ST	25	BR375330	COIL, CHOKE 0022 K	4			L6, L7	
39	6,000	ST	25	BR363944	COIL, CHOKE HF WIDE BAND	4			L10, L11, L12, L13, L14, L21	
40	1,000	ST	25	BR450413	COIL, CHOKE 1M0 K	4			L16	
41	1,000	ST	25	BR454532	COIL M 3000 A2 L18	1			L18	
42	1,000	ST	25	BR450774	COIL, CHOKE 33J K	4			L19	
43	1,000	ST	25	BR450782	COIL, CHOKE 82J K	4			L20	
44	1,000	ST	25	BR450766	COIL, CHOKE 27J J	4			L22	
45	1,000	ST	41	BR460184	REAR PLATE A 2	1			MP1	
46	1,000	ST	45	BR448095	RETAINER, PC 5X5X109 MM	2			MP2	
47	2,000	ST	51	BR260819	THUMBSCREW, KNURLED M3	3			MP3	
48	1,000	ST	31	BR459356	CONTACT SPRING 1 A2-3-4	1			MP5	
49	1,000	ST	31	BR459364	CONTACT SPRING 2 A1-2-3-4	1			MP4	
50	1,000	ST	31	BR493910	JUMPER 0,1" 2P FEMALE	4			P2	
51	1,000	ST	26	BR399914	TRANS. JFETN J 309 T0-92	4			Q1	
52	2,000	ST	26	BR359157	TRANS. LOPOW BC 251 SI-P T	4			Q2, Q13	
53	6,000	ST	26	BR451274	TRANS. LOPOW MPS2369 SI-N	4			Q3, Q7, Q15, Q16, Q18, Q19	
54	2,000	ST	26	BR451320	TRANS. LOPOW 2N3906 SI-P T	4			Q4, Q5	
55	5,000	ST	26	BR273899	TRANS. LOPOW BC 547B SI-N	4			Q6, Q10, Q12, Q14, Q17	
56	1,000	ST	26	BR451290	TRANS. JFETP 2N5450 T0-92	4			Q8	
57	1,000	ST	26	BR389730	TRANS. JFETN J-211-18	4			Q9	
58	1,000	ST	26	BR451312	TRANS. LOPOW BF 199 SI-N T	4			Q11	
59	17,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R1, R2, R17, R30, R46, R50, R73, R79, R80, R84, R90, R91, R92, R99, R100, R105, R107	
60	2,000	ST	21	BR240451	RES CARB. 2K2 1/4J SFR25	4			R3, R108	
61	3,000	ST	21	BR240125	RES CARB. 22R 1/4J SFR25	4			R4, R31, R88	
62	1,000	ST	21	BR376515	RES FILM 3K65 0,6F MRS25	4			R5	
63	3,000	ST	21	BR349569	RES FILM 6K81 0,6F MRS25	4			R6, R66, R67	



TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark

TITLE:
STANDARD TCXU

A2

DOCUMENT NO.:
60 - BR448184
(448184)

REV: A4

SHEET NO.: 2 OF 5

Parts List

PRINTED..... 91/05/23
PARTS LIST PER.. 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
64	3,000	ST	21	BR349526	RES FILM 4K75 0,6F MRS25	4			R7,R9,R10	
65	2,000	ST	21	BR349623	RES FILM 10K0 0,6F MRS25	4			R8,R13	
66	1,000	ST	21	BR488283	RES FILM 53K6 0,6F MRS25	4			R11	
67	1,000	ST	21	BR349518	RES FILM 39K2 0,6F MRS25	4			R12	
68	1,000	ST	21	BR349496	RES FILM 100K 0,6F MRS25	4			R14	
69	1,000	ST	21	BR240281	RES CARB. 270R 1/4J SFR25	4			R15	
70	2,000	ST	21	BR444871	RES FILM 27K4 0,6F MRS25	4			R16,R18	
71	1,000	ST	21	BR349666	RES FILM 1K00 0,6F MRS25	4			R19	
72	7,000	ST	21	BR328545	RES CARB. 220R 1/4J SFR25	4			R20,R23,R32,R33,R37,R87,	
73	4,000	ST	21	BR240338	RES CARB. 390R 1/4J SFR25	4			R89	
74	3,000	ST	21	BR240516	RES CARB. 4K7 1/4J SFR25	4			R21,R22,R35,R36 R24,R106,R110	
75	2,000	ST	21	BR240494	RES CARB. 3K9 1/4J SFR25	4			R25,R86	
76	1,000	ST	21	BR240273	RES CARB. 240R 1/4J SFR25	4			R26	
77	1,000	ST	21	BR363251	RES CARB. 39R 1/4J SFR25	4			R27	
78	1,000	ST	21	BR359572	RES CARB. 110R 1/4J SFR25	4			R28	
79	5,000	ST	21	BR240362	RES CARB. 560R 1/4J SFR25	4			R29,R34,R39,R76,R83	
80	1,000	ST	21	BR240257	RES CARB. 180R 1/4J SFR25	4			R38	
81	13,000	ST	21	BR240567	RES CARB. 10K 1/4J SFR25	4			R40,R42,R44,R54,R64,R78, R82,R95,R97,R98,R101,R102, R104	
82	3,000	ST	21	BR240540	RES CARB. 6K8 1/4J SFR25	4			R41,R51,R96	
83	2,000	ST	21	BR240605	RES CARB. 15K 1/4J SFR25	4			R43,R74	
84	1,000	ST	21	BR372137	RES CARB. 20K 1/4J SFR25	4			R45	
85	5,000	ST	21	BR240478	RES CARB. 2K7 1/4J SFR25	4			R47,R48,R75,R77,R93	
86	8,000	ST	21	BR451096	RES FILM 4K75 1/4D MPR24	4			R52,R53,R55,R56,R57,R58, R60,R70	
87	1,000	ST	21	BR349593	RES FILM 2K74 0,6F MRS25	4			R59	
88	1,000	ST	21	BR451118	RES FILM 560R 1/4D	4			R61	
89	1,000	ST	21	BR451126	RES FILM 10K0 1/4D	4			R62	
90	1,000	ST	21	BR240583	RES CARB. 12K 1/4J SFR25	4			R63	
91	1,000	ST	21	BR349607	RES FILM 18K2 0,6F MRS25	4			R65	
92	1,000	ST	21	BR365831	RES CARB. 680K 1/4J SFR25	4			R68	
93	1,000	ST	21	BR451134	RES FILM 12K4 1/4D	4			R69	
94	1,000	ST	21	BR372110	RES FILM 19K6 0,6F MRS25	4			R71	
95	2,000	ST	21	BR436879	RES SEMIV 20K 3/4K CERM	4			R49,R72	A4



TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark

TITLE: STANDARD TCXU

DOCUMENT NO.: 60 - BR448184
(448184)

REV: A4


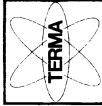
SHEET NO.: 3 UF 5

Parts List

PRINTED..... 91/05/23
PARTS LIST PER.. 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
96	1,000	ST	21	BR240222	RES CARB. 100R 1/4J SFR25	4			R81	
97	1,000	ST	21	BR240214	RES CARB. 82R 1/4J SFR25	4			R85	
98	1,000	ST	21	BR240346	RES CARB. 470R 1/4J SFR25	4			R94	
99	1,000	ST	21	BR240656	RES CARB. 33K 1/4J SFR25	4			R109	
100	1,000	ST	21	BR368598	RES SEMIV 500R 1/2K CERM	4			R111	
101	17,000	ST	31	BR231304	TERMINAL STUO 2,5X7 W1,3	4			TP	A2
102	4,000	ST	24	BR488143	IC DGTL 74HCT163 BIN.COUN	4			U1,U2,U13,U14	
103	4,000	ST	24	BR488089	IC DGTL 74HCT 74 2X D-FF	4			U3,U15,U18,U36	
104	1,000	ST	24	BR451231	IC LIN LM 723C VOLT REGL.	4			U5	
105	3,000	ST	24	BR451282	IC LIN LF 356N OP.AMP.	4			U6,U19,U20	
106	1,000	ST	24	BR488763	IC DGTL 74HCT393 2XBIN.CO	4			U7	
107	1,000	ST	24	BR488003	IC DGTL 74HCT 00 4X2IN NA	4			U9	
108	1,000	ST	24	BR450375	IC DGTL 10116P ECL BUFFER	4			U10	
109	1,000	ST	24	BR357898	IC DGTL 74S112 2X JK-FF	4			U11	
110	1,000	ST	24	BR451177	IC DGTL 74LS290N DEC.COUN	4			U12	
111	1,000	ST	24	BR433535	IC DGTL 74LS04 6XINVERTER	4			U16	
112	1,000	ST	24	BR451258	IC LIN LM 2901N VOLT COMP	4			U17	
113	1,000	ST	24	BR451266	IC LIN LM 301A OP.AMP.	4			U21	
114	1,000	ST	24	BR451215	IC LIN DAC-08EN D/A CONV.	4			U22	
115	1,000	ST	24	BR451304	IC LIN LM 3046N TRANS.ARR	4			U23	
116	1,000	ST	24	BR488127	IC DGTL 74HCT138 3-8 DECD	4			U24	
117	1,000	ST	24	BR488011	IC DGTL 74HCT 02 4X2IN NU	4			U25	
118	1,000	ST	24	BR488755	IC DGTL 74HCT365 6XBUSDRI	4			U27	
119	2,000	ST	24	BR488224	IC DGTL 74HCT377 8X D-FF	4			U28,U29	
120	3,000	ST	24	BR488704	IC DGTL 74HCT175 4X D-FF	4			U30,U31,U34	
121	3,000	ST	24	BR490156	IC DGTL 74HCT283 4BIT ADD	4			U32,U33,U35	
122	2,000	ST	24	BR451150	IC DGTL 74LS669N U/D COUN	4			U37,U38	
123	1,000	ST	24	BR375349	IC LIN 78L05 VOLT REGL.	4			U39	
124	1,000	ST	23	BR228818	D10 ZEN ZPD 2.7 2.7V 0.5W	4			VR1	
125	1,000	ST	23	BR451223	D10 ZEN. BZX792V4 2.4V	4			VR2	
126	2,000	ST	23	BR228842	D10 ZEN ZPD 5.6 5.6V 0.5W	4			VR3,VR4	
127	1,000	ST	33	BR216070	FUSE ACCESS CLIPS	4			XY1	
128	2,000	ST	31	BR486825	CONN 1P FEMALE	4			XY1	
129	1,000	ST	20	BR496189	CRYSTAL 73,60000MHZ HC42-	3			Y1	
130	1,000	ST	20	BR451142	CRYSTALOSC 10,24MHZ TCXD	4			Y2	
131	1,000	ST	22	BR357502	CAP. CER. 33P 100 G N150	4			C8	A3

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark



TITLE:
STANDARD TUXU A2

DOCUMENT NO.:
60 - BR448184
(448184)

REV: A4



SHEET NO.: 4 OF 5

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
132	1,000	ST	22	BR357529	CAP. CER. 47P 100 C N150	4			C9	A3
*****	*****	*****	*****	*****	***** BILL OF DOCUMENTATION *****	*****	*****	*****	*****	*****
			EB EC	BR448184 BR448184	STANDARD TCXU STANDARD TCXU A2					
			ND PD TP	BR448184 BR448184 BRQA4420	STD TCXU A2-LUG POINT FREQ. GENERATOR STANDARD OCX/TCX A2 RX4000					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR465429	M3000/TCXU/INCL. DUPLEX	1				

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark



TITLE:
STANDARD TCXU A2

DOCUMENT NO.:
60 - BR448184
(448184

REV: A4

SHEET NO.:
5 OF 5

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	GL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR448192	PWB,FRONT END ASSY A3	3				
2	1,000	ST	60	BR448222	INPUT AMPLIFIER A3A1	1			A1	
3	1,000	ST	68	BR448249	1.MIXER ASSY A3A2	1			A2	
4	1,000	ST	62	BR448265	LO AMPLIFIER ASSY A3A3	1			A3	
5	1,000	ST	61	BR448281	1-IF AMPLIFIER ASSY A3A4	1			A4	
6	1,000	ST	60	BR448311	75 MHZ AGC ASSY A3A5	1			A5	
7	1,000	ST	68	BR448346	2-MIXER ASSY A3A6	1			A6	
8	1,000	ST	61	BR448362	2-IF AMPLIFIER ASSY A3A7	1			A7	
9	1,000	ST	22	BR450952	CAPFEED THROUGH 82P250 J	4			C1	
10	26,000	ST	22	BR450510	CAP. CER. 100N 63 S	4			C67,C68,C69,C70,C71,C72,C73,C74,C75,C76,C77,C78,C80,C81,C83,C84,C85,C87,C88,C89,C91,C92,C93,C94,C95,C123C110,C111	A1
11	2,000	ST	22	BR459534	CAP. PLST 100N 63 M	4				A4
12	1,000	ST	22	BR448834	CAP. PLST 1N5 160 H	4			C79	
13	3,000	ST	22	BR450529	CAP. ELEC 6J8 25 M	4			C82,C86,C90	
14	7,000	ST	22	BR358959	CAP. CER. 1N0 100 K	4			C96,C97,C98,C99,C100,C101,C102	
15	10,000	ST	23	BR450944	DIO SIGN. 1S 921 SI 200MA	4			CR4,CR5,CR6,CR7,CR8,CR9,CR10,CR11,CR15,CR16	
16	1,000	ST	22	BR209791	CAP. TAN. 2U2 35 S	4			C104	
17	4,000	ST	22	BR357545	CAP. CER. 68P 100 C N150	4			C117,C118,C119,C120	
18	9,000	ST	25	BR375314	COIL,ACCESS FERRITCORE	4			E1,E2,E3,E4,E5,E6,E7,E8,E9	
19	1,000	ST	20	BR363367	FILTER,XTAL 75MHZ 12KHZ	3			FL1	
20	8,000	ST	20	BR450960	FILTER,CER-PHI 0U5	4			FL6,FL7,FL8,FL9,FL10,FL11,FL12,FL13	
21	28,000	ST	51	BR276758	SCREW M 2 X 6 CHM CU SN	4			H1	
22	5,000	ST	51	BR458694	SCREW M 2,5X 5 CHM CU SN	4			H2	
23	0,200	M	32	BR438227	FLEX TEFLON Ø0,7X Ø1,2	4			H3	
24	4,000	ST	51	BR325619	SCREW SELFTA.4X3/16 RPPX	4			H4	
25	1,000	ST	25	BR450065	COIL,ACCESS SCREEN,CAN	4			H5	
26	1,000	ST	31	BR475521	COAX CUNN SMB FEM-PWB	4			J1	
27	4,000	ST	25	BR450413	COIL,CHOKE 1M0 K	4			L31,L32,L33,L34	
28	5,000	ST	25	BR363944	COIL,CHOKE HF WIDE BAND	4			L36,L37,L38,L39,L40	



TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark

TITLE:

FRONT END ASSY A3

DOCUMENT NO.:

60 - BR448206
(448206)

REV:

82

SHEET NO.:

1 OF 2

Parts List										
PRINTED..... 91/05/23 PARTS LIST PER.. 91/05/22										
FIND NO.	QTY REQ	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
29	1,000	ST	41	BR460192	REAR PLATE A 3	1			MP1	
30	1,000	ST	45	BR448095	RETAINER,PC 5X5X109 MM	2			MP2	
31	2,000	ST	51	BR260819	THUMBSCREW,KNURLED M3	3			MP3	
32	1,000	ST	41	BR460001	SCREEN BOX ASSY A3	1			MP4	
33	4,000	ST	21	BR240435	RES CARB. 1K8 1/4J SFR25	4			R60,R61,R62,R63	
34	4,000	ST	21	BR240605	RES CARB. 15K 1/4J SFR25	4			R64,R65,R66,R67	
35	2,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R68,R69	
36	1,000	ST	25	BR451908	TRAFU A3T7	1			T7	
37	9,000	ST	51	BR231304	TERMINAL STUD 2,5X7 Ø1,3	4			TP	
38	1,000	ST	24	BR362131	IC DGTL 74 06N 6X INV-BUF	4			U4	
39	1,000	ST	24	BR488127	IC DGTL 74HCT138 3-8 DECO	4			U5	
40	1,000	ST	24	BR488224	IC DGTL 74HCT377 8X D-FF	4			U6	A2
41	1,000	ST	37	BR458805	COAX CA ASSY SMB - 190MM	3			W1	
42	1,000	ST	37	BR458813	COAX CA ASSY SMB - 245MM	3			W2	
43	1,000	ST	37	BR458821	COAX CA ASSY SMB - 235MM	3			W3	
44	0,500	ML	76	205254-001	ADHESIVE SILICONE, RTV	4				B
45	1,000	ST	48	214073-004	LABEL, ADHESIVE, ESD	2				B2
*****	*****	*****	*****	*****	*** BILL OF DOCUMENTATION	*****	*****	*****	*****	*****
1001			PJ	BR448206	FRONT END ASSY A3					
1002			EC	BR448206	FRONT END ASSY A3					
1003			EB	BR448206	FRONT END ASSY					
1004			TP	BRQA4430	A3/RX4000/RX4009/RX4010					
1005			AS	206460	ESD, PROTECTION & MARKING					
1006			AS	201350	WORKMANSHIP					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR465429	M3000/ICXD/INCL. DUPLEX	1				
TERMA Elektronik AS Dansk Radio Division DK-2630 Tåstrup, Denmark					TITLE: FRONT END ASSY A3	DOCUMENT NO.: 60 - BR448206 (448206			REV: B2	SHEET NO.: 2 UF 2

Parts List

PRINTED..... 91/05/23
PARTS LIST PER.. 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR448214	PWB, INPUT AMPLIFIER A3A1	3				
2	1,000	ST	22	BR357553	CAP. CER. 82P 100 C N150	4			C2	
3	5,000	ST	22	BR450529	CAP. ELEC 608 25 M	4			C3, C6, C7, C9, C106	
4	1,000	ST	22	BR491349	CAP. PLST 330N 63 K	4			C4	
5	2,000	ST	22	BR357391	CAP. CER. 4P7 100 C N150	4			C5, C105	
6	1,000	ST	22	BR459534	CAP. PLST 100N 63 M	4			C8	
7	1,000	ST	22	BR357480	CAP. CER. 22P 100 G N150	4			C103	
8	1,000	ST	26	BR349135	TRANS. ACCESS HEATSI.105	4			H1	
9	1,000	ST	26	BR218944	TRANS. ACCESS PAD 10-5	4			H2	
10	1,000	ST	25	BR375330	COIL, CHOKE 0U22 K	4			L1	
11	1,000	ST	25	BR363308	COIL, CHOKE 470U	4			L3	
12	4,000	ST	52	BR394742	STAY NUT M2 X 5 Ø4 F/PWB	3			MPL	
13	1,000	ST	26	BR362514	TRANS. HIPOW 2N5109 SI-N I	4			Q1	
14	1,000	ST	26	BR369454	TRANS. DARLN MPSA13 SI-N I	4			Q9	
15	1,000	ST	21	BR478369	RES FILM 66K5 0.6F MRS25	4			R1	
16	1,000	ST	21	BR240451	RES CARB. 2K2 1/4J SFR25	4			R2	
17	1,000	ST	21	BR240419	RES CARB. 1K2 1/4J SFR25	4			R3	
18	1,000	ST	21	BR240265	RES CARB. 200R 1/4J SFR25	4			R4	
19	1,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R74	
20	1,000	ST	21	BR240575	RES CARB. 11K 1/4J SFR25	4			R75	
21	1,000	ST	25	BR495840	TRAFO A3A1I1	1			T1	
*****	*****	*****	*****	*****	*** BILL OF DOCUMENTATION	*****	*****	*****	*****	*****
			PD TP	BR489638 BRQA4431	FRONT END ASSY A3 AMP. A3A1 RX4000/RX4010 A3					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR448206	FRONT END ASSY A3	1				


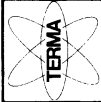
TERMA Elektronik AS Dansk Radio Division DK-2630 Tåstrup, Denmark				TITLE: INPUT AMPLIFIER A3A1	DOCUMENT NO.: 60 - BR448222 (448222	REV: A1	SHEET NO.: 1 OF 1	1
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Parts List

PRINTET..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR448230	PWB, 1. MIXER A3A2	3				
2	1,000	ST	22	BR357553	CAP. CER. 82P 100 C N150	4			C27	
3	1,000	ST	22	BR357472	CAP. CER. 18P 100 G N150	4			C28	
4	1,000	ST	22	BR357480	CAP. CER. 22P 100 G N150	4			C29	
5	1,000	ST	22	BR357588	CAP. CER. 120P 100 G N150	4			C30	
6	1,000	ST	22	BR357596	CAP. CER. 150P 100 G N150	4			C31	
7	1,000	ST	25	BR393967	COIL, CHOKE 0015 K	4			L14	
8	1,000	ST	25	BR450391	COIL, CHOKE 0039 K	4			L15	
9	1,000	ST	25	BR450405	COIL, CHOKE 0068 K	4			L16	
10	1,000	ST	25	BR357820	COIL, CHOKE 2J2 K	4			L17	
11	4,000	ST	52	BR394742	STAY NUT M2 X 5 04 F/PWB	3			MP1	
12	1,000	ST	21	BR240192	RES CARB. 51R 1/4J SFR25	4			R22	
13	1,000	ST	24	BR362530	IC HYBRID SRA 3H BAL. MIXE	4			U1	
*****	*****	*****	*****	*****	***** BILL OF DOCUMENTATION *****	*****	*****	*****	*****	*****
			TP	BRQA4432	1. MIXER A3A2 RX4000 A3					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR448206	FRONT END ASSY A3	1				

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark



TITLE:
1. MIXER ASSY A3A2

DOCUMENT NO.:
68 - BR448249
(+48249)

REV: A1

SHEET NO.:
1 OF 1

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR448257	PWB M3000 A3A3	3				
2	6,000	ST	22	BR358959	CAP. CER. 1N0 100 K	4			C10,C11,C13,C16,C17,C20	
3	4,000	ST	22	BR357642	CAP. CER. 10N 100 S	4			C12,C14,C18,C19	
4	1,000	ST	22	BR357537	CAP. CER. 56P 100 C	4			C15	
5	1,000	ST	22	BR357480	CAP. CER. 22P 100 G	4			C21	
6	1,000	ST	22	BR357383	CAP. CER. 3P9 100 C	4			C22	
7	1,000	ST	22	BR357499	CAP. CER. 27P 100 G	4			C23	
8	1,000	ST	22	BR357464	CAP. CER. 15P 100 G	4			C24	
9	2,000	ST	22	BR357413	CAP. CER. 6P8 100 C	4			C25,C26	
10	1,000	ST	26	BR386847	TRANS. ACCESS	4			H1	
11	1,000	ST	26	BR349135	TRANS. ACCESS	4			H2	
12	1,000	ST	26	BR218944	TRANS. ACCESS	4			H3	
13	1,000	ST	26	BR218952	TRANS. ACCESS	4			H4	
14	4,000	ST	25	BR357820	COIL,CHOKE 2J2 K	4			L4,L5,L6,L7	
15	3,000	ST	25	BR375330	COIL,CHOKE 0J22 K	4			L8,L9,L12	
16	1,000	ST	25	BR394335	COIL,CHOKE 0U1 K	4			L10	
17	1,000	ST	25	BR393967	COIL,CHOKE 0U15 K	4			L11	
18	1,000	ST	25	BR363944	COIL,CHOKE HF WIDE BAND	4			L13	
19	4,000	ST	52	BR394742	STAY NUT M2 X 5 04 F/PWB	3			MPL	
20	1,000	ST	26	BR357804	TRANS.UHF BFX 89 SI-N TO-	4			Q2	
21	1,000	ST	26	BR362514	TRANS.HIPOW 2N5109 SI-N T	4			Q3	
22	1,000	ST	21	BR240435	RES CARB. 1K8 1/4J SFR25	4			R6	
23	2,000	ST	21	BR450979	RES CARB. 360R 1/4J SFR25	4			R7,R16	
24	1,000	ST	21	BR240478	RES CARB. 2K7 1/4J SFR25	4			R8	
25	1,000	ST	21	BR240397	RES CARB. 820R 1/4J SFR25	4			R9	
26	1,000	ST	21	BR240133	RES CARB. 24R 1/4J SFR25	4			R10	
27	2,000	ST	21	BR240273	RES CARB. 240R 1/4J SFR25	4			R11,R19	
28	1,000	ST	21	BR240346	RES CARB. 470K 1/4J SFR25	4			R12	
29	2,000	ST	21	BR240265	RES CARB. 200R 1/4J SFR25	4			R13,R20	
30	1,000	ST	21	BR240443	RES CARB. 2K0 1/4J SFR25	4			R14	
31	1,000	ST	21	BR240419	RES CARB. 1K2 1/4J SFR25	4			R15	
32	2,000	ST	21	BR240117	RES CARB. 18R 1/4J SFR25	4			R17,R18	
33	1,000	ST	21	BR240192	RES CARB. 51R 1/4J SFR25	4			R21	
*****	*****	*****	*****	*****	***** BILL OF DOCUMENTATION *****	*****	*****	*****	*****	*****



TITLE:
LU AMPLIFIER ASSY A3A3

DOCUMENT NO.:
62 - BR448265
(448265

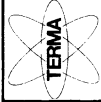

REV: A1

SHEET NO.: 1 OF 2

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
	1,000	ST	TP	BRQA4433	LU AMP A3A3 RX4000 A3					
				BR448206	FRONT END ASSY A3	1				

TERMA Elektronik AS Dansk Radio Division DK-2630 Tåstrup, Denmark	 	TITLE: LU AMPLIFIER ASSY A3A3	DOCUMENT NO.: 62 - BR448265 (448265	REV: A1	SHEET NO.: 2 UF 2
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Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR448273	PWB, 1. IF AMPLIFIER A3A4	3				
2	1,000	ST	22	BR357472	CAP. CER. 18P 100 G N150	4			C32	
3	1,000	ST	22	BR357480	CAP. CER. 22P 100 G N150	4			C33	
4	1,000	ST	22	BR373419	CAP. SEM 2-18P TEFLON	4			C34	
5	1,000	ST	22	BR357502	CAP. CER. 33P 100 G N150	4			C35	
6	5,000	ST	22	BR450510	CAP. CER. 100N 63 S	4			C38,C39,C41,C45,C47	
7	3,000	ST	22	BR358959	CAP. CER. 1N0 100 K	4			C40,C42,C46	
8	1,000	ST	22	BR361356	CAP. CER. 2P2 500 C N750	4			C44	
9	1,000	ST	23	BR228087	DIU SIGN. 1N4148 SI 150MA	4			CRL	
10	1,000	ST	26	BR349097	TRANS. ACCESS HEATSI.T05	4			H1	
11	1,000	ST	26	BR349135	TRANS. ACCESS HEATSI.T05	4			H2	
12	1,000	ST	24	BR373362	IC ACCESS 10 PIN PAD T0-5	4			H3	
13	1,000	ST	26	BR218944	TRANS. ACCESS PAD T0-5	4			H4	
14	1,000	ST	31	BR358665	COAX CONN SMB FEM-PWB	4			J1	
15	4,000	ST	25	BR375330	COIL, CHUKE 0022 K	4			L18,L19,L20,L21	
16	1,000	ST	25	BR357820	COIL, CHUKE 202 K	4			L22	
17	1,000	ST	25	BR392294	COIL, CHUKE 100 K	4			L23	
18	4,000	ST	52	BR394742	STAY NUT M2 X 5 04 F/PWB	3			MP1	
19	1,000	ST	26	BR273899	TRANS. LUPOW BC 5478 SI-N	4			W4	
20	1,000	ST	26	BR448710	TRANS. JFETN U 431 DUAL T0	4			W5	
21	1,000	ST	26	BR362514	TRANS. HIPOW 2N5109 SI-N T	4			W6	
22	2,000	ST	21	BR371033	RES FILM 100R 0.6F MRS25	4			R23,R24	
23	1,000	ST	21	BR458260	RES SEMIV 20R 1/2K CERM	4			R25	
24	1,000	ST	21	BR240443	RES CARB. 2K0 1/4J SFR25	4			R26	
25	3,000	ST	21	BR240419	RES CARB. 1K2 1/4J SFR25	4			R27,R28,R35	
26	1,000	ST	21	BR240567	RES CARB. 10K 1/4J SFR25	4			R30	
27	1,000	ST	21	BR240222	RES CARB. 100K 1/4J SFR25	4			R31	
28	1,000	ST	21	BR240451	RES CARB. 2K2 1/4J SFR25	4			R32	
29	2,000	ST	21	BR240109	RES CARB. 10R 1/4J SFR25	4			R33,R36	
30	1,000	ST	21	BR240214	RES CARB. 82R 1/4J SFR25	4			R34	
31	1,000	ST	21	BR377538	RES CARB. 30R 1/4J SFR25	4			R98	
32	1,000	ST	25	BR451940	TRAFU A3A4T2	1			T2	
33	1,000	ST	25	BR451967	TRAFU A3A4T3	1			T3	
*****	*****	*****	*****	*****	***** BILL OF DOCUMENTATION *****	*****	*****	*****	*****	*****

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, DenmarkTITLE:
1. IF AMPLIFIER ASSY A3A4DOCUMENT NO.:
61 - BR448281
(448281)

REV: A1


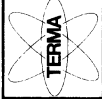
SHEET NO.: 1 OF 2

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

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1	1,000	ST	37	BR448303	PWB,75 MHZ AGC A3A5	3				
2	5,000	ST	22	BR358959	CAP. CER. 1N0 100 K	4			C48,C55,C62,C63,C103	
3	5,000	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	4			C49,C50,C53,C59,C64	A1
4	1,000	ST	22	202542-067	CAP. CER. 3P9 / 100C	4			C54	B
5	2,000	ST	22	BR357561	CAP. CER. 100P 100 G NPO	4			C56,C57	
6	1,000	ST	22	BR357472	CAP. CER. 18P 100 G N150	4			C58	
7	1,000	ST	22	BR357480	CAP. CER. 22P 100 G N150	4			C60	
8	1,000	ST	22	BR202797	LAP. SEM 18P PLST.FOIL	4			C61	
9	3,000	ST	23	BR228087	DIO SIGN. 1N4148 SI 150MA	4			CR2,CR3,CR12	
10	1,000	ST	23	BR452238	DIO PIN BA 389 USURTERET	4			CR13	
11	1,000	ST	23	BR228826	DIO ZEN ZPD 3.3 3.3V 0.5W	4			CR14	
12	1,000	ST	22	BR393959	CAP. CER. 100N 50 M	4			C107	
13	1,000	ST	25	BR376213	COIL,ACCESS FERRITBEAD	4			E10	
14	1,000	ST	25	BR450073	COIL,ACCESS SCREEN,CAN	4			H2	
15	2,000	ST	25	BR375330	COIL,CHOKE 0U22 K	4			L24,L25	
16	1,000	ST	25	BR451983	COIL A3A5 L41	1			L41	
17	1,000	ST	25	BR355933	COIL,CHOKE 6U8 K	4			L42	
18	4,000	ST	52	BR394742	STAY NUT M2 X 5 Ø4 F/PWB	3			MPL	
19	1,000	ST	26	BR478695	TRANS.MFETN BF 981 2XG SO	4			Q7	
20	1,000	ST	26	BR273899	TRANS.LUPOW BC 547B SI-N	4			Q9	
21	1,000	ST	26	BR357901	TRANS.JFETN J 310 IU-92	4			Q10	
22	1,000	ST	21	BR324191	RES CARB. 7K5 1/4J SFR25	4			R37	
23	1,000	ST	21	BR478687	RES FILM 200R 0.6F MRS25	4			R38	
24	1,000	ST	21	BR478679	RES FILM 887R 0.6F MRS25	4			R39	
25	2,000	ST	21	BR240605	RES CARB. 15K 1/4J SFR25	4			R40,R82	
26	2,000	ST	21	BR240567	RES CARB. 10K 1/4J SFR25	4			R41,R48	
27	1,000	ST	21	BR372064	RES CARB. 9K1 1/4J SFR25	4			R42	
28	1,000	ST	21	BR487902	RES SEMIV 2K 1/2K CERM	4			R43	
29	1,000	ST	21	BR240443	RES CARB. 2K0 1/4J SFR25	4			R44	
30	1,000	ST	21	BR324213	RES CARB. 3K0 1/4J SFR25	4			R45	
31	1,000	ST	21	BR478660	RES FILM 1K82 0.6F MRS25	4			R46	
32	2,000	ST	21	BR240516	RES CARB. 4K7 1/4J SFR25	4			R47,R80	
33	1,000	ST	21	BR240591	RES CARB. 13K 1/4J SFR25	4			R49	
34	3,000	ST	21	BR240141	RES CARB. 27K 1/4J SFR25	4			R50,R51,R75	
35	1,000	ST	21	BR240648	RES CARB. 27K 1/4J SFR25	4			R70	
36	3,000	ST	21	BR240230	RES CARB. 120R 1/4J SFR25	4			R71,R76,R78	

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark



TITLE:
75 MHZ AGC ASSY A3A5

DOCUMENT NO.:
60 - BR448311
(448311)

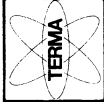
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SHEET NO.:
1 OF 2

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
37	1,000	SI	21	BR240397	RES CARB. 820R 1/4J SFR25	4			R72	
38	1,000	SI	21	BR324221	RES CARB. 2K4 1/4J SFR25	4			R73	
39	1,000	SI	21	BR240265	RES CARB. 200R 1/4J SFR25	4			R74	
40	1,000	SI	21	BR240427	RES CARB. 1K5 1/4J SFR25	4			R77	
41	1,000	SI	21	BR240192	RES CARB. 51R 1/4J SFR25	4			R79	
42	1,000	SI	21	BR357693	RES CARB. 150K 1/4J SFR25	4			R81	
43	1,000	SI	21	BR240583	RES CARB. 12K 1/4J SFR25	4			R83	
44	1,000	SI	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R84	
45	1,000	SI	21	BR240656	RES CARB. 33K 1/4J SFR25	4			R85	
46	1,000	SI	21	BR458252	RES NTC 4K7 K MB22	4			RT1	
47	1,000	SI	25	BR499609	TRAF0 A3A5T4	1			T4	B
48	1,000	SI	24	BR462292	IC LIN TL 084 4X OP.AMP.	4			U2	
*****	*****	*****	*****	*****	***** BILL OF DOCUMENTATION *****	*****	*****	*****	*****	*****
			PD IP	BR489638 BRJA4435	FRONT END ASSY A3 75 MHZ AGC A3A5 RX4000 A3					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	SI		BR448206	FRONT END ASSY A3	1				


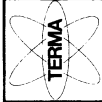
TERMA Elektronik AS Dansk Radio Division DK-2630 Tåstrup, Denmark		TITLE: 75 MHZ AGC ASSY A3A5	DOCUMENT NO.: 60 - BR448311 (448311	REV: B	SHEET NO.: 2 OF 2	2
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Parts List

PRINTED..... 91/05/23
PARIS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	SI	37	BR448338	PWB, 2. MIXER A3A6	3				
2	2,000	SI	22	BR357510	CAP. CER. 39P 100 G N150	4			C59, C60	
3	2,000	SI	25	BR394335	COIL, CHOKE 001 K	4			L27, L28	
4	4,000	SI	52	BR394742	STAY NUT M2 X 5 Ø4 F/PWB	3			MP1	
5	2,000	SI	21	BR240192	RES CARB. 51R 1/4J SFR25	4			R52, R53	
6	1,000	SI	24	BR362522	IC HYBRID SRA 1 BAL. MIXER	4			U3	
*****	*****	*****	*****	*****	*** BILL OF DOCUMENTATION ***	*****	*****	*****	*****	*****
			PD TP	BR489638 BRQA4436	FRONT END ASSY A3 2. MIXER A3A6 RX4000 A3					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	SI		BR448206	FRONT END ASSY A3	1				

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark



TITLE:
2. MIXER ASSY A3A6

DOCUMENT NO.:
68 - 3R448346
(448346)

REV: A1

SHEET NO.:
1 OF 1

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQ	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR448354	PWB M3000 A3A7	3				
2	2,000	ST	22	BR357634	CAP. CER. 2N2 100 K HI-K	4			C61,C62	
3	1,000	ST	22	BR358932	CAP. PLST 200P 400 F	4			C63	
4	3,000	ST	22	BR450510	CAP. CER. 100N 63 S	4			C64,C65,C66	
5	2,000	ST	25	BR393975	COIL,CHOKE 5U6 K	4			L29,L30	
6	4,000	ST	52	BR394742	STAY NUT M2 X 5 04 F/PWB	3			MPL	
7	1,000	ST	26	BR357901	TRANS. JFETN J 310 IO-92	4			Q8	
8	2,000	ST	21	BR240192	RES CARB. 51R 1/4J SFR25	4			R54,R55	
9	1,000	ST	21	BR240168	RES CARB. 33R 1/4J SFR25	4			R56	
10	1,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R57	
11	1,000	ST	21	BR240109	RES CARB. 10R 1/4J SFR25	4			R58	
12	1,000	ST	21	BR240230	RES CARB. 120R 1/4J SFR25	4			R59	
13	1,000	ST	25	BR489581	TRAFU A3A7T5	1			T5	
14	1,000	ST	25	BR451894	TRAFU A3A7T6 M 3000	1			T6	
*****	*****	*****	*****	*****	***** BILL OF DOCUMENTATION *****	*****	*****	*****	*****	*****
			PD	BR448206	FRONT END ASSY A3					
			TP	BRQA4437	2.1F AMP. A3A7 RX4000 A3					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR448206	FRONT END ASSY A3	1				

**TERMA Elektronik AS**
Dansk Radio Division
DK-2630 Tåstrup, Denmark

TITLE:
2.1F AMPLIFIER ASSY A3A7

DOCUMENT NO.:
61 - BR448362
(448362

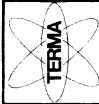
REV: A1

SHEET NO.:
1 OF 1

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR448370	PWB M3000 A4	3				
2	5,000	ST	22	BR202975	CAP. PLST 1U 100 K	4			C1,C6,C65,C66,C75	
3	7,000	ST	22	BR393959	CAP. CER. 100N 50 M	4			C2,C26,C29,C30,C50,C61,	
4	1,000	ST	22	BR357510	CAP. CER. 39P 100 G N150	4			C80	
5	1,000	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	4			C3 C4	
6	17,000	ST	22	BR450510	CAP. CER. 100N 63 S	4			C5,C8,C10,C20,C22,C32,C36, C42,C48,C60,C62,C63,C64, C67,C73,C74,C76	
7	2,000	ST	22	BR357421	CAP. CER. 8P2 100 C N150	4			C9,C24	
8	4,000	ST	22	BR448796	CAP. PLST 430P 630 H	4			C11,C19,C55,C56	
9	2,000	ST	22	BR448788	CAP. PLST 270P 630 H	4			C12,C57	
10	2,000	ST	22	BR448761	CAP. PLST 240P 630 H	4			C13,C58	
11	2,000	ST	22	BR448850	CAP. PLST 2N2 160 H	4			C14,C59	
12	2,000	ST	22	BR466980	CAP. PLST 120P 630 H	4			C15,C51	
13	2,000	ST	22	BR466972	CAP. PLST 68P 630 H	4			C16,C52	
14	2,000	ST	22	BR448737	CAP. PLST 27P 630 H	4			C17,C53	
15	2,000	ST	22	BR448729	CAP. PLST 12P 630 H	4			C18,C54	
16	1,000	ST	22	BR475874	CAP. VAR2X335P POLY	4			C21	
17	2,000	ST	22	BR361356	CAP. CER. 2P2 500 C N750	4			C23,C27	
18	1,000	ST	22	BR357448	CAP. CER. 10P 100 G N150	4			C28	
19	2,000	ST	22	BR448842	CAP. PLST 1N8 160 H	4			C31,C46	
20	1,000	ST	22	BR448826	CAP. PLST 820P 630 H	4			C33	
21	1,000	ST	22	BR357588	CAP. CER. 120P 100 G N150	4			C34	
22	3,000	ST	22	BR357545	CAP. CER. 68P 100 C N150	4			C35,C68,C72	
23	2,000	ST	22	BR448869	CAP. PLST 2N4 630 H	4			C37,C39	
24	1,000	ST	22	BR448818	CAP. PLST 470P 630 H	4			C38	
25	1,000	ST	22	BR357529	CAP. CER. 47P 100 C N150	4			C40	
26	1,000	ST	22	BR357456	CAP. CER. 12P 100 G N150	4			C41	
27	1,000	ST	22	BR396389	CAP. CER. 680P 40 M	4			C43	
28	2,000	ST	22	BR448834	CAP. PLST 1N5 160 H	4			C44,C45	
29	1,000	ST	22	BR390224	CAP. CER. 470P 100 K HI-K	4			C49	
30	2,000	ST	22	BR357464	CAP. CER. 15P 100 G N150	4			C69,C71	
31	1,000	ST	22	BR357596	CAP. CER. 150P 100 G N150	4			C70	
32	3,000	ST	22	BR450529	CAP. ELEC 6J8 25 M	4			C77,C78,C79	
33	2,000	ST	23	BR345865	DIO POW.BYX 71 S1 350V 7A	4			CR1,CR2	



TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark

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
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FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
34	4,000	ST	23	BR450987	DIO SIGN. 1N4150 SI 400MA	4			CR4,CR5,CR19,CR20	
35	15,000	ST	23	BR228087	DIO SIGN. 1N4148 SI 150MA	4			CR8,CR9,CR21,CR22,CR23,CR24,CR25,CR26,CR27,CR29,CR30,CR31,CR32,CR33,CR34	
36	8,000	ST	23	BR450944	DIO SIGN. 1S 921 SI 200MA	4			CR10,CR11,CR12,CR13,CR14,CR15,CR16,CR17	
38	4,000	ST	51	BR450553	SCREW SELFTAP.2X11/4 PHPX-	4			H2	A1
39	6,000	ST	51	BR435686	SCREW PINOL M 3 X 3 S UNB	4			H3	A2
41	7,000	ST	51	BR458694	SCREW M 2,5X 5 CHM CU SN	4			H5	A1
42	1,000	ST	31	BR368210	COAX CONN BNC FEM-CHASS.	4			J1	
43	1,000	ST	31	BR475521	COAX CONN SMB FEM-PWB	4			J2	A1
44	27,000	ST	33	BR359521	RELAY REED DIP15VDC 2K0 1	4			K1,K2,K3,K4,K5,K6,K7,K8,K9,K10,K11,K12,K13,K14,K15,K16,K17,K18,K19,K20,K21,K22,K23,K24,K25,K26,K27	
45	2,000	ST	25	BR457590	COIL A4	1			L1	A1
46	2,000	ST	25	BR451673	COIL M 3000 A4	1			L2,L40	
47	2,000	ST	25	BR451681	COIL M 3000 A4	1			L3,L41	
48	10,000	ST	25	BR451657	COIL M 3000 A4	1			L4,L5,L6,L8,L9,L33,L34,L36,L37,L42	
49	2,000	ST	25	BR451649	COIL M 3000 A4	1			L7,L35	
50	2,000	ST	25	BR451746	COIL M 3000 A4	1			L10,L12	
51	1,000	ST	25	BR450030	COIL,CHOKE 0U15 K	4			L11	
52	2,000	ST	25	BR451703	COIL M 3000 A4	1			L13,L15	
53	1,000	ST	25	BR450006	COIL,CHOKE 33U K	4			L14	
54	1,000	ST	25	BR451665	COIL M 3000 A4	1			L16	
55	2,000	ST	25	BR450014	COIL,CHOKE 30J K	4			L17,L18	
56	2,000	ST	25	BR450057	COIL,CHOKE 2U7 K	4			L19,L20	
57	1,000	ST	25	BR363294	COIL,CHOKE 47J J	4			L21	
58	1,000	ST	25	BR450049	COIL,CHOKE 56J J	4			L22	
59	1,000	ST	25	BR451738	COIL M 3000 A4	1			L23	
60	1,000	ST	25	BR448982	COIL,CHOKE 330J J	4			L24	
61	1,000	ST	25	BR451711	COIL M 3000 A4	1			L25	
62	1,000	ST	25	BR448974	COIL,CHOKE 2M0 J	4			L26	
63	1,000	ST	25	BR457752	COIL M 3000 A4	1			L27	



TERMA Elektronik AS
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FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION		
64	1,000	ST	25	BR467006	COIL,CHOKE 4U7	4			L28		
65	1,000	ST	25	BR467014	COIL,CHOKE 330U	4			L29		
66	2,000	ST	25	BR364045	COIL,CHOKE 10M J	4			L30,L44		
67	2,000	ST	25	BR458201	COIL,CHOKE 3U3 K	4			L31,L50		
68	7,000	ST	25	BR448990	COIL,CHOKE 100U K	4			L32,L38,L39,L43,L47,L48, L49		
70	2,000	ST	25	BR450022	COIL,CHOKE 0U33 K	4			L45,L46		
71	5,000	ST	25	BR392294	COIL,CHOKE 10U K	4			L51,L52,L53,L54,L55		
72	1,000	ST	25	BR450782	COIL,CHOKE 82U K	4			L56		
73	1,000	ST	41	BR460206	REAR PLATE PRESEL M3000A4	2			MP1		
74	1,000	ST	45	BR448095	RETAINER,PC 5X5X109 MM	2			MP2		
75	1,000	ST	51	BR260819	THUMBSCREW,KNURLED M3	3			MP3		
76	1,000	ST	42	BR450693	AXLE SHAFT RETAIN.1 M3000	1			MP4		
77	1,000	ST	42	BR458198	AXLE SHAFT RETAIN.2 M3000	1			MP5		
78	1,000	ST	42	BR450707	SHAFT,TEFLON M 3000 A4	3			MP6		
79	1,000	ST	53	BR450715	SPRING M 3000 A4	3			MP7		
80	1,000	ST	53	BR450723	WASHER M 3000 A4	3			MP8		
81	1,000	ST	42	BR450731	SHAFT M 3000 A4	1			MP9		
82	1,000	ST	27	BR458228	COUPLING M 3000 A4	3			MP10		
83	1,000	ST	31	BR459356	CONTACT SPRING 1 A2-3-4	1			MP11		
84	1,000	ST	31	BR459364	CONTACT SPRING 2 A1-2-3-4	1			MP12		
85	1,000	ST	55	BR465143	RING,LOCK M 3000 A4	1			MP13		
86	2,000	ST	41	BR480851	INSULATION PLATE M3000 A4	1			MP14		
87	1,000	ST	46	BR480568	BRACKET,CAP. M 3000 A4	1			MP15		
88	3,000	ST	26	BR273899	TRANS. LOPOW BC 5478 SI-N	4			Q1,Q3,Q4		
89	3,000	ST	26	BR359157	TRANS. LOPOW BC 251 SI-P T	4			Q2,Q5,Q6		
90	14,000	ST	21	BR380393	RES CARB. 270K 1/4J SFR25	4			R1,R3,R4,R8,R9,R16,R28, R34,R35,R55,R56,R57,R62, R63		
91	2,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R2,R31		
92	1,000	ST	21	BR240524	RES CARB. 5K6 1/4J SFR25	4			K5		
93	1,000	ST	21	BR241458	RES CARB. 1K0 1/2JSFR25H	4			K6		
94	1,000	ST	21	BR240850	RES CARB. 560K 1/4J SFR25	4			K7		
95	1,000	ST	21	BR240486	RES CARB. 3K3 1/4J SFR25	4			R10		
96	2,000	ST	21	BR240478	RES CARB. 2K7 1/4J SFR25	4			R11,R59		
97	2,000	ST	21	BR357693	RES CARB. 150K 1/4J SFR25	4			R12,R13		
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98	3,000	ST	21	BR240516	RES CARB. 4K7 1/4J SFR25	4			R14,R20,R53	
99	1,000	ST	21	BR240435	RES CARB. 1K8 1/4J SFR25	4			R15	
100	1,000	ST	21	BR240281	RES CARB. 270R 1/4J SFR25	4			R17	
101	3,000	ST	21	BR240702	RES CARB. 56K 1/4J SFR25	4			R18,R19,R21	
102	2,000	ST	21	BR240222	RES CARB. 100R 1/4J SFR25	4			R22,R48	
103	2,000	ST	21	BR240656	RES CARB. 33K 1/4J SFR25	4			R23,R26	
104	4,000	ST	21	BR363057	RES CARB. 2M2 1/4J SFR25	4			R24,R25,R37,R38	
105	3,000	ST	21	BR240109	RES CARB. 10R 1/4J SFR25	4			R29,R50,R54	
106	3,000	ST	21	BR240621	RES CARB. 22K 1/4J SFR25	4			R36,R39,R60	
107	2,000	ST	21	BR361992	RES CARB. 68R 1/4J SFR25	4			R40,R43	
108	1,000	ST	21	BR240567	RES CARB. 10K 1/4J SFR25	4			R41	
109	1,000	ST	21	BR240494	RES CARB. 3K9 1/4J SFR25	4			R42	
110	4,000	ST	21	BR240745	RES CARB. 100K 1/4J SFR25	4			R44,R45,R46,R52	
111	1,000	ST	21	BR363251	RES CARB. 39R 1/4J SFR25	4			R47	
112	1,000	ST	21	BR240206	RES CARB. 56R 1/4J SFR25	4			R51	
113	1,000	ST	21	BR240605	RES CARB. 15K 1/4J SFR25	4			R61	
114	1,000	ST	33	BR451010	SW,MICRO SPDT 10A 250V	4			S1	
115	1,000	ST	24	BR433683	IC DCTL 74LS138 3-8 DECUD	4			U1	
116	1,000	ST	24	BR451029	IC DCTL 74LS377N 8X D-FF	4			U2	
117	2,000	ST	24	BR404586	IC DCTL 74 45N BCD-DECIMA	4			U3,U4	
118	1,000	ST	24	BR433535	IC DCTL 74LS04 6X INVERTER	4			U5	
119	1,000	ST	24	BR362131	IC DCTL 74 06N 6X INV-BUF	4			U6	
120	1,000	ST	23	BR450995	DIO ZEN 1N4738 8.2V 1W	4			VR1	
121	1,000	ST	23	BR228869	DIO ZEN ZPD 7.5 7.5V 0.5W	4			VR2	
122	1,000	ST	23	BR228796	DIO ZEN ZPD12 12V 0.5W	4			VR3	
123	1,000	ST	23	BR361488	DIO ZEN ZPD 3.9 3.9V 0.5W	4			VR4	A1
124	0,001	ML	76	205254-001	ADHESIVE SILICONE, RTV	4				
125	2,000	ST	51	BR483362	SCREW PINOL M 3 X 6 R UNB	4				
126	0,125	M	32	200824-005	WIRE, ELEC, AWG-24 GRN	4				A2
127	1,000	ST	48	214073-004	LABEL, ADHESIVE, ESD	2				A3
*****	*****	*****	*****	*****	***** BILL OF DOCUMENTATION *****	*****	*****	*****	*****	*****
1001			PD	BR448389	PRESELECTOR, MARINE DUPLEX					A5
1002			EB	BR448389	PRESELECTOR					
1003			EC	BR448389	PRESELECTOR, MARINE DUPLEX					

TERMA Elektronik AS Dansk Radio Division DK-2630 Tåstrup, Denmark		TITLE: PRESELECTOR IN-DJPL A4		DOCUMENT NO.: 60 - BR448389 (448389)	REV: A5	SHEET NO.: 4 OF 5
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1000			AS	206460	ESD, PROTECTION & MARKING					
1007			AS	201350	MURKMANSHIP					
1008			IP	BRQA4442	PRESEL. M3000/RX4000 A4					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR465429	M3000/TCXO/INCL. DUPLEX	1				

TERMA Elektronik AS
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1	1,000	ST	37	BR448435	PWB M3000 A7	3			C1,C3,C4,C5,C6,C9,C11,C12,C14,C17,C18,C19,C20,C21,C22,C24,C25,C26,C30,C37,C45,C46,C47,C49,C50,C51,C52,C53,C54,C55,C56,C57,C59,C60,C61,C62,C63,C64,C65,C67,C68,C69,C70,C71,C72,C73,C74,C76,C77,C78,C79,C83,C84,C90,C96,C97,C99,C100,C104	
2	59,000	ST	22	BR450510	CAP. CER. 100N 03 S	4			C2,C23,C94	
									C7	
									C8,C15,C16,C34	
									C10,C31,C32,C36,C38,C39,C40,C43,C44,C48,C58,C66,C75,C80,C81,C82,C87,C91,C95	
3	3,000	ST	22	BR448834	CAP. PLST 1N5 160 H	4			C13	
4	1,000	ST	22	BR357588	CAP. CER. 120P 100 G N150	4			C27,C29,C101	
5	4,000	ST	22	BR448877	CAP. PLST 3N3 160 H	4			C28	
6	19,000	ST	22	BR450529	CAP. ELEC 6J8 25 M	4			C33	
									C35	
7	1,000	ST	22	BR358959	CAP. CER. 1N0 100 K	4			C41	
8	3,000	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	4			C42	
9	1,000	ST	22	BR448885	CAP. PLST 4N7 160 H	4			C85,C86,C88	
10	1,000	ST	22	BR448893	CAP. PLST 5N1 160 H	4			C89,C98	
11	1,000	ST	22	BR448788	CAP. PLST 270P 630 H	4			C92	
12	1,000	ST	22	BR357650	CAP. CER. 22N 63 A HI-K	4			C93	
13	1,000	ST	22	BR357561	CAP. CER. 100P 100 G NPO	4			CK1,CK2,CK3,CK4,CR5,CR6,CR7	
14	3,000	ST	22	BR357634	CAP. CER. 2N2 100 K HI-K	4			C102,C103	
15	2,000	ST	22	BR450359	CAP. ELEC 1U 25 M	4			E1	
16	1,000	ST	22	BR384895	CAP. PLST 22N 63 F	4			H1	
17	1,000	ST	22	BR448923	CAP. PLST 15N 63 F	4			H2	
18	7,000	ST	23	BR228087	DIO SIGN. 1N4148 SI 150MA	4			H3	
19	2,000	ST	22	BR357553	CAP. CER. 82P 100 G N150	4				
20	1,000	ST	25	BR376213	COIL,ACCESS FERRITBEAD	4				
21	5,000	ST	51	BR458694	SCREW M 2,5X 5 CHM CU SN	4				
22	1,000	ST	31	BR495905	CONN U ACCESS. JACK SUCKT	4				
23	2,000	ST	24	BR373362	IC ACCESS IO PIN PAD IO-5	4				



TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark

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FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
24	1,000	ST	25	BR450065	COIL, ACCESS SCREEN, CAN	4			H4	
25	1,000	ST	31	BR475521	COAX CONN SMB FEM-PWB	4			J1	
26	1,000	ST	31	BR373273	CONN D PWB ANG 9P MALE	4			J4	
27	1,000	ST	25	BR451975	COIL M 3000 A7 L2	1			L2	
28	3,000	ST	25	BR363944	COIL, CHOKE HF WIDE BAND	4			L3, L4, L5	
29	1,000	ST	41	BR460222	REAR PLATE A 7	1			MP1	
30	1,000	ST	45	BR448095	RETAINER, PC 5X5X109 MM	2			MP2	
31	2,000	ST	51	BR260819	THUMBSCREW, KNURLED M3	3			MP3	
32	1,000	ST	41	BR450901	SCREEN SHIELD M 3000 A7	1			MP4	
33	1,000	ST	41	BR450928	SCREEN SHIELD M 3000 A7	1			MP5	
34	1,000	ST	41	BR450936	SCREEN SHIELD M 3000 A7	1			MP6	
35	2,000	ST	26	BR357901	TRANS.-JFETN J 310 TO-92	4			Q1, Q9	
36	1,000	ST	26	221373-001	TRANSISTOR, 3N201, N-CH.	4			Q2	A1
37	7,000	ST	26	BR273899	TRANS.-LOPOW BC 547B SI-N	4			Q3, Q4, Q5, Q6, Q7, Q10, Q11	
38	1,000	ST	26	BR359157	TRANS.-LOPOW BC 251 SI-P T	4			Q8	
39	11,000	ST	21	BR240109	RES CARB. 10R 1/4J SFR25	4			R1, R13, R14, R57, R78, R81, R85, R88, R92, R96, R99	
40	3,000	ST	21	BR240206	RES CARB. 56R 1/4J SFR25	4			R2, R21, R150	
41	4,000	ST	21	BR240230	RES CARB. 120R 1/4J SFR25	4			R3, R77, R84, R91	
42	3,000	ST	21	BR328545	RES CARB. 220R 1/4J SFR25	4			K4, K6, R101	
43	2,000	ST	21	BR349542	RES FILM 22K1 0.6F MRS25	4			R5, R145	
44	8,000	ST	21	BR240516	RES CARB. 4K7 1/4J SFR25	4			R7, R16, R17, R70, R132, R137, R143, R144	
45	1,000	ST	21	BR240761	RES CARB. 120K 1/4J SFR25	4			R8	
46	3,000	ST	21	BR240613	RES CARB. 18K 1/4J SFR25	4			R9, R59, R104	
47	3,000	ST	21	BR240605	RES CARB. 15K 1/4J SFR25	4			R10, R39, R60	
48	3,000	ST	21	BR363227	RES SEMIV 10K 1/2K GERM	4			R11, R119, R142	
49	5,000	ST	21	BR240427	RES CARB. 1K5 1/4J SFR25	4			R12, R53, R54, R106, R118	
50	3,000	ST	21	BR240257	RES CARB. 180R 1/4J SFR25	4			R15, R48, R108	
51	5,000	ST	21	BR240222	RES CARB. 100R 1/4J SFR25	4			R18, R68, R72, R98, R124	
52	1,000	ST	21	BR240184	RES CARB. 47R 1/4J SFR25	4			R19	
53	14,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R20, R22, R27, R42, R67, R113, R115, R116, R123, R136, R138, R139, R140, R141	
54	2,000	ST	21	BR240451	RES CARB. 2K2 1/4J SFR25	4			R23, R111	
55	1,000	ST	21	BR391980	RES SEMIV 2K 1/2K GERM	4			R24	

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark



TITLE:
IF/AF ASSY

DOCUMENT NO.:
62 - BR448443
(448443)

REV: A2

SHEET NO.:
2 OF 5

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
56	4,000	ST	21	BR240311	RES CARB. 330R 1/4J SFR25	4			R25,R51,R52,R149	A2
57	6,000	ST	21	BR240567	RES CARB. 10K 1/4J SFR25	4			R26,R31,R38,R47,R125,R126	
58	6,000	ST	21	BR240702	RES CARB. 56K 1/4J SFR25	4			R28,R29,R30,R32,R33,R73	
59	4,000	ST	21	BR240745	RES CARB. 100K 1/4J SFR25	4			R34,R40,R41,R107	
60	1,000	ST	21	BR366498	RES FILM 12K1 0,6F MRS25	4			R35	
61	2,000	ST	21	BR450316	RES FILM 47K5 0,6F MRS25	4			R36,R37	
62	3,000	ST	21	BR240680	RES CARB. 47K 1/4J SFR25	4			R43,R63,R74	
63	1,000	ST	21	BR324191	RES CARB. 7K5 1/4J SFR25	4			R44	
64	2,000	ST	21	BR240729	RES CARB. 75K 1/4J SFR25	4			R45,R50	
65	1,000	ST	21	BR359165	RES SEMIV 10K 1/2K CERM	4			R46	
66	1,000	ST	21	BR240125	RES CARB. 22R 1/4J SFR25	4			R49	
67	1,000	ST	21	BR450324	RES FILM 4K32 0,6F MRS25	4			R55	
68	1,000	ST	21	BR368539	RES FILM 7K50 0,6F MRS25	4			R56	
69	1,000	ST	21	BR240494	RES CARB. 3K9 1/4J SFR25	4			R58	
70	1,000	ST	21	BR240648	RES CARB. 27K 1/4J SFR25	4			R61	
71	1,000	ST	21	BR357715	RES SEMIV 1K 1/2K CERM	4			R62	
72	1,000	ST	21	BR240346	RES CARB. 470R 1/4J SFR25	4			R64	
73	3,000	ST	21	BR240192	RES CARB. 51K 1/4J SFR25	4			R65,R66,R117	
74	1,000	ST	21	BR240443	RES CARB. 2K0 1/4J SFR25	4			R69	
75	1,000	ST	21	BR240699	RES CARB. 51K 1/4J SFR25	4			R71	
76	1,000	ST	21	BR240354	RES CARB. 510R 1/4J SFR25	4			R75	
77	8,000	ST	21	BR240362	RES CARB. 560R 1/4J SFR25	4			R76,R82,R83,R89,R90,R95, R97,R103	
78	5,000	ST	21	BR240397	RES CARB. 820R 1/4J SFR25	4			R79,R86,R93,R100,R110	
79	4,000	ST	21	BR240168	RES CARB. 33K 1/4J SFR25	4			R80,R87,R94,R102	
80	1,000	ST	21	BR361542	RES CARB. 1K5 1/4J SFR25	4			R105	
81	1,000	ST	21	BR376310	RES SEMIV 200R 1/2K CERM	4			R109	
82	1,000	ST	21	BR328626	RES CARB. 220K 1/4J SFR25	4			R112	
83	1,000	ST	21	BR240419	RES CARB. 1K2 1/4J SFR25	4			R114	
84	2,000	ST	21	BR240486	RES CARB. 3K3 1/4J SFR25	4			R120,R121	
85	1,000	ST	21	BR240583	RES CARB. 12K 1/4J SFR25	4			R122	
86	2,000	ST	21	BR240737	RES CARB. 82K 1/4J SFR25	4			R127,R128	
87	1,000	ST	21	BR433136	RES FILM 6K19 0,6F MRS25	4			R129	
88	2,000	ST	21	BR444871	RES FILM 27K4 0,6F MRS25	4			R130,R131	
89	1,000	ST	21	BR240656	RES CARB. 33K 1/4J SFR25	4			R133	
90	1,000	ST	21	BR240621	RES CARB. 22K 1/4J SFR25	4			R134	

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark



TITLE:
1F/AF ASSY

DOCUMENT NO.:
62 - BR448443
(448443)

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A2

SHEET NO.:
3 UF

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Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
91	1,000	ST	21	BR366889	RES CARB. 180K 1/4J SFR25	4			R135	
92	1,000	ST	21	BR369578	RES FILM 5K11 0.6F MRS25	4			R146	
93	1,000	ST	21	BR376477	RES FILM 1K27 0.6F MRS25	4			R147	
94	1,000	ST	21	BR349593	RES FILM 2K74 0.6F MRS25	4			R148	
95	1,000	ST	25	BR451959	TRAFO A7 T2 M 3000	1			T2	
96	1,000	ST	25	BR451932	TRAFO A7 T3 M 3000	1			T3	
97	1,000	ST	25	BR362859	TRAFO, LINE 600:600R	4			T4	
98	11,000	ST	31	BR231304	TERMINAL STUD 2,5X7 Ø1,3	4			TP	
99	1,000	ST	24	BR450286	IC LIN MC 1349P IF AMP.	4			U1	
100	1,000	ST	24	BR460613	IC LIN TBA 120S FM-ZF-AMP	4			U2	
101	1,000	ST	24	BR354821	IC DCTL 4066B 4X ANA.SW.	4			U3	
102	3,000	ST	24	BR357707	IC LIN MC 1458P OP.AMPL.	4			U4, U5, U12	
103	1,000	ST	24	BR393622	IC DCTL 74 07N 6X BUF.OC.	4			U6	
104	1,000	ST	24	BR373532	IC LIN CA 723C VOLT.REGL.	4			U7	
105	1,000	ST	24	BR450294	IC LIN TL 082CP OP.AMP.	4			U8	
106	2,000	ST	24	BR450308	IC LIN CA 3083 TRANS ARR.	4			U9, U10	
107	1,000	ST	24	BR361585	IC LIN MC 1496G MUD-DEMUD	4			U11	
108	1,000	ST	24	BR488127	IC DCTL 74HCT138 3-8 DECU	4			U13	
109	1,000	ST	24	BR454028	IC DCTL 74LS378N 6X D FF	4			U14	
110	1,000	ST	24	BR488755	IC DCTL 74HCT365 6XBUSDRI	4			U15	
111	1,000	ST	24	BR362131	IC DCTL 74 06N 6X INV-BUF	4			U16	
112	1,000	ST	24	BR488011	IC DCTL 74HCT 02 4X2IN NG	4			U17	
113	1,000	ST	23	BR228842	D10 ZEN ZPD 5.6 5.6V 0.5W	4			VR1	
114	1,000	ST	23	BR228796	D10 ZEN ZPD12 12V 0.5W	4			VR2	
115	1,000	ST	23	BR228869	D10 ZEN ZPD 7.5 7.5V 0.5W	4			VR3	
116	2,000	ST	23	BR228818	D10 ZEN ZPD 2.7 2.7V 0.5W	4			VR4, VR5	
117	1,000	ST	37	BR458740	COAX CA ASSY - - 240MM	3			W1	
118	1,000	ST	37	BR458759	COAX CA ASSY GNC - 195MM	3			W2	
119	1,000	ST	37	BR456993	COAX CA ASSY SMB - 225MM	3			W3	
***** BILL OF DOCUMENTATION *****										*****
			EB	BR448443	IF/AF ASSY					
			EC	BR448443	IF/AF ASSY A7					
			PD	BR448443	IF/AF ASSY A7					
			TP	BR444470	IF/AF ASSY A7 RX4000					



TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark

TITLE:
IF/AF ASSY A7

DOCUMENT NO.:
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(448443)

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A2

SHEET NO.:
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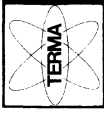
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	TERMA Elektronik AS Dansk Radio Division DK-2630 Tåstrup, Denmark	
	TITLE: IF / AF ASSY	DOCUMENT NO.: A7 02 - 0R440443 (448443)
REV: A2		SHEET NO.: 5 OF 5

Parts List

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FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR448451	PWB M3000 A8	3				
2	1,000	ST	20	BR391921	BATTERY 3V LITHIUM	4			BT1	
3	1,000	ST	22	BR451053	LAP. ELEC 68J 6,3 M	4			C1	
4	1,000	ST	22	BR451339	CAP. ELEC 15J 10 M	4			C2	
5	1,000	ST	22	BR357650	CAP. CER. 22N 63 A HI-K	4			C3	
6	1,000	ST	22	BR437395	CAP. CER. 220P 100 G N750	4			C4	
7	25,000	ST	22	BR450510	CAP. CER. 100N 63 S	4			C5, C6, C7, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40 C9, C11, C15 C10	
8	3,000	ST	22	BR357642	LAP. CER. 10N 100 S HI-K	4				
9	1,000	ST	22	BR400389	CAP. PLST 220N 63 K	4				
10	1,000	ST	22	BR349070	CAP. PLST 680N 100 K	4			C12	
11	1,000	ST	22	BR202991	CAP. PLST 220N 100 K	4			C13	
12	1,000	ST	22	BR454117	CAP. PLST 68N 250 K	4			C14	
13	3,000	ST	22	BR450529	CAP. ELEC 6J8 25 M	4			C16, C17, C18	
14	1,000	ST	22	BR357634	CAP. CER. 2N2 100 K HI-K	4			C42	
15	3,000	ST	23	BR228001	DIO SCHOT BAT 85 SI 200MA	4			CR1, CR11, CR19	
16	11,000	ST	23	BR228087	DIO SIGN. IN4148 SI 150MA	4			CR4, CR5, CR6, CR7, CR8, CR9, CR10, CR12, CR14, CR20, CR21 CR15, CR16, CR17, CR18	
17	4,000	ST	23	BR450480	DIO LED HLMP1000 RED Ø3	4			CR23	
18	1,000	ST	23	BR328324	DIO SIGN. AAZ 15 GE 140MA	4			H1	
19	5,000	ST	51	BR458694	SCREW M 2,5X 5 CHM CU SN	4			H2	
20	1,000	ST	31	BR495905	CUNN D ACCESS. JACK SOCKET	4			H3	
21	8,000	ST	26	BR392707	TRANS. ACCESS PAD TU-18	4			H4	
22	15,000	MM	34	222837-004	TAPE, DOUBLE-SIDED 1.6MM	4			J1	
23	1,000	ST	31	BR368016	CUNN D PWB ANG 15P FEMALE	4			L1, L2, L3	
24	3,000	ST	25	BR363944	COIL, CHOKE HF WIDE BAND	4			MP1	
25	1,000	ST	41	BR460230	REAR PLATE A 8 MICROC. STD	1			MP2	
26	1,000	ST	45	BR448095	RETAINER, PC 5X5X109 MM	2			MP3	
27	2,000	ST	51	BR260819	THUMBSCREW, KNURLED M3	3			W1, W2, W3, Q8	
28	4,000	ST	26	BR392820	TRANS. LOPOW 2N2222A SI-N	4			Q9, Q11	
29	2,000	ST	26	BR392839	TRANS. LOPOW 2N2907A SI-P	4			R1, R5, R7, R10, R11, R12, R13, R14, R15, R19, R21, R25, R27, R33, R34, R35, R36, R39, R40,	
30	32,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25	4				

**TERMA Elektronik AS**
Dansk Radio Division
DK-2630 Tåstrup, Denmark

TITLE:
MICROCOMPUTER ASSY A8 STD

DOCUMENT NO:
00 - BR448478
(448478)

REV:
B

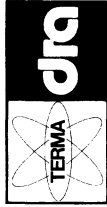
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Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
									R41,R42,R47,R48,R49,R51,R71,R82,R88,R89,R97,R98,R99	
31	3,000	ST	21	BR357693	RES CARB. 150K 1/4J SFR25	4			R2,R3,R4	
32	3,000	ST	21	BR372137	RES CARB. 20K 1/4J SFR25	4			R6,R59,R62	
33	2,000	ST	21	BR240699	RES CARB. 51K 1/4J SFR25	4			R8,R9	
34	6,000	ST	21	BR241458	RES CARB. 1K0 1/2JSFR25H	4			R16,R17,R22,R23,R28,R29	
35	3,000	ST	21	BR240257	RES CARB. 180R 1/4J SFR25	4			R18,R24,R30	
36	3,000	ST	21	BR240494	RES CARB. 3K9 1/4J SFR25	4			R20,R26,R32	
37	4,000	ST	21	BR240249	RES CARB. 150R 1/4J SFR25	4			R43,R44,R45,R46	
38	2,000	ST	21	BR324205	RES CARB. 5K1 1/4J SFR25	4			R64,R66	
39	7,000	ST	21	BR240567	RES CARB. 10K 1/4J SFR25	4			R65,R77,R79,R81,R83,R85,R90	
40	1,000	ST	21	BR391093	RES SEMIV 20K 1/2K CERM	4			R67	
41	7,000	ST	21	BR240702	RES CARB. 50K 1/4J SFR25	4			R68,R72,R73,R84,R86,R87,R93	
42	1,000	ST	21	BR240869	RES CARB. 1M0 1/4J SFR25	4			R69	
43	2,000	ST	21	BR240443	RES CARB. 2K0 1/4J SFR25	4			R70,R76	
44	2,000	ST	21	BR240338	RES CARB. 390R 1/4J SFR25	4			R75,R95	
45	1,000	ST	21	BR240745	RES CARB. 100K 1/4J SFR25	4			R78	
46	1,000	ST	21	BR240605	RES CARB. 15K 1/4J SFR25	4			R80	
47	1,000	ST	21	BR362913	RES CARB. 15R 1/4J SFR25	4			R91	
48	1,000	ST	21	BR380393	RES CARB. 270K 1/4J SFR25	4			R100	
49	4,000	ST	31	BR457698	WRAP-PIN 0.64X0.64X	4			TP	
50	1,000	ST	31	BR458554	CUNN AMP MODU2 3P MALE	4			TP	
51	1,000	ST	31	BR458562	CUNN AMP MODU2 16P MALE	4			TP	
52	1,000	ST	24	BR433799	IC DGTL 8085 MICROPRUG.	4			U1	
53	1,000	ST	24	BR433527	IC DGTL 74LS123 2XMONOSTA	4			U2	
54	3,000	ST	24	BR433535	IC DGTL 74LS04 6XINVERTER	4			U3,U5,U10	
55	1,000	ST	24	BR451541	IC DGTL 74LS 14N 6XINV ST	4			U4	
56	3,000	ST	24	BR362131	IC DGTL 74 06N 6X INV-BUF	4			U6,U37,U56	
57	1,000	ST	24	BR434752	IC DGTL 74LS08N 4X2 IN AN	4			U7	
58	2,000	ST	24	BR404705	IC DGTL 74LS00N 4X2IN NAN	4			U8,U15	
59	4,000	ST	24	BR451576	IC DGTL 74LS161A BIN COUN	4			U9,U38,U39,U40	
60	2,000	ST	24	BR437107	IC DGTL 74LS32N 4X2 INP	4			U11,U20	
61	1,000	ST	24	BR451614	IC DGTL 74LS373N 8X D LAT	4			U12	

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark



TITLE:
MICROCOMPUTER ASSY A8 STD

DOCUMENT NO.:
00 - BR448478
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REV: B

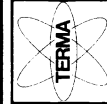
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Parts List

PRINTED..... 91/05/23
PARTS LIST PER.: 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
62	1,000	ST	24	BR451169	IC DGTL 74LS365N 6X BUSDR	4			U13	
63	2,000	ST	24	BR365874	IC DGTL 74LS 74N 2X D FF	4			U14,U28	
64	2,000	ST	24	BR451592	IC DGTL 74LS240N 8X BUF.1	4			U16,U41	
65	2,000	ST	24	BR451606	IC DGTL 74LS245N 8 BIT TR	4			U17,U27	
66	1,000	ST	24	BR393592	IC DGTL 74LS11 5X3 IN AND	4			U18	
67	3,000	ST	24	BR433683	IC DGTL 74LS138 3-8 DECOD	4			U19,U21,U26	
68	2,000	ST	24	BR433608	IC DGTL 74LS21 2X4 IN AND	4			U22,U48	
69	3,000	ST	24	BR404551	IC DGTL 74 37N 4X21N NAND	4			U29,U30,U31	
70	1,000	ST	24	BR390909	IC DGTL 1488L 4XLINEDRIV	4			U32	
71	1,000	ST	24	BR390917	IC DGTL 1489A 4XLIN RCVR	4			U33	
72	3,000	ST	24	BR433632	IC LIN MCA 255 OPTO ISUL	4			U34,U35,U36	
73	1,000	ST	24	BR451622	IC DGTL 74LS259N 8X LATCH	4			U42	
74	1,000	ST	24	BR451630	IC DGTL 74LS379N 4X D-FF	4			U43	
75	1,000	ST	24	BR451568	IC DGTL 74LS145N BCD-DEC	4			U44	
76	2,000	ST	24	BR454044	IC DGTL 2114A 1K X 4 RAM	4			U45,U46	
77	3,000	ST	24	BR455466	IC DGTL 444 1KX4 RAM	4			U47,U60,U61	
78	1,000	ST	24	BR355003	IC DGTL 4049B 6X INV-BUF	4			U49	
79	1,000	ST	24	BR354899	IC DGTL 4027A 2X JK FF	4			U50	
80	1,000	ST	24	BR355046	IC DGTL 4071B 4X2 INP OR	4			U51	
81	1,000	ST	24	BR451029	IC DGTL 74LS377N 8X D-FF	4			U52	
82	1,000	ST	24	BR451215	IC LIN DAC-08EN D/A CONV.	4			U53	
83	2,000	ST	24	BR450294	IC LIN TL 082CP OP.AMP.	4			U54,U55	
84	2,000	ST	24	BR354821	IC DGTL 4060B 4X ANA.SW.	4			U57,U58	
85	1,000	ST	24	BR455474	IC LIN LM 3302N VOLT CUMP	4			U59	
86	2,000	ST	23	BR363324	DIO ZEN ZPD 5.1 5.1V 0.5W	4			VR1,VR2	
87	1,000	ST	23	BR228834	DIO ZEN ZPD 4.7 4.7V 0.5W	4			VR3	
88	1,000	ST	24	BR451452	IC ACCESS 40 PIN SOCKET	4			XU1	
89	3,000	ST	24	BR435120	IC ACCESS 28 PIN SOCKET	4			XU23,XU24,XU25	
90	2,000	ST	24	BR362832	IC ACCESS 14 PIN SOCKET	4			XU32,XU33	
91	5,000	ST	24	BR451460	IC ACCESS 18 PIN SOCKET	4			XU45,XU46,XU47,XU60,XU61	
92	1,000	ST	20	BR433853	CRYSTAL 6,14400MHZ HC49-U	4			Y1	
93	0,050	M	32	200843-009	WIRE CUP TIN-CTD Ø0.6 MM	4				A1
94	40,000	MM	34	200873-007	SLEEVING TUBE, PTFE,AWG18	4				A1
*****	*****	*****	*****	*****	***** BILL OF DOCUMENTATION *****	*****	*****	*****	*****	*****

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark



TITLE: MICROCOMPUTER ASSY A8 STD

DOCUMENT NO.:
00 - BK448478
1448478

REV: 8

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Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
			EB EC PD	BR 448478 BR 448478 BR 448478	MICROCOMPUTER MICROCOMPUTER MICROCOMPUTER					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR 465429	M3000/TCXO/INCL. DUPLEX	1				



TITLE:
MICROCOMPUTER ASSY AB STD

DOCUMENT NO.:
60 - BR 448478
(448478)

REV: B

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Parts List

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PARTS LIST PER., 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	61	BR448559	REGULATOR ASSY A10A1	1			A1	
2	1,000	ST	25	BR448575	TRAFU ASSY A10A2 220V	1			A2	
3	1,000	ST	56	BR458341	HEATSINK ASSY A10A3	1			A3	
4	4,000	ST	51	BR458694	SCREW M 2.5X 5 CHM CU SN	4			H1	
6	4,000	ST	51	BR275638	SCREW M 4 X 8 CHJ GULCR	4			H3	
7	1,000	ST	31	BR495905	CONN D ACCESS. JACK SOCKET	4			H4	
8	2,000	ST	51	BR260819	THUMBSCREW,KNURLED M3	3			MP1	
9	1,000	ST	31	BR446068	CONN D PWB ANG 9P FEMALE	4				A1
*****	*****	*****	*****	*****	*** BILL OF DOCUMENTATION	*****	*****	*****	*****	*****
			EB	BR448532	POWER SUPPLY ASSY A10					
			EC	BR448532	POWER SUPPLY ASSY A10					
			PD	BR448532	POWER SUPPLY ASSY A10 24/					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR465429	M3000/TCXD/INCL. DUPLEX	1				



Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR448540	PWB M3000A10A1	3				
2	1,000	ST	37	BR483273	PWB, RES BD M3000A10A1	3				
3	3,000	ST	22	BR454265	CAP. ELEC 100U 25 T	4			C1, C20, C33	B
4	2,000	ST	22	BR202967	CAP. PLST 100N 100 K	4			C2, C21	
5	12,000	ST	22	BR450510	CAP. CER. 100N 63 S	4			C3, C5, C7, C8, C10, C13, C15, C34, C37, C43, C45, C46	
6	2,000	ST	22	BR357634	CAP. CER. 2N2 100 K HI-K	4			C4, C12	
7	2,000	ST	22	BR454273	CAP. ELEC 220U 25 T	4			C6, C42	
8	9,000	ST	22	BR450529	CAP. ELEC 608 25 M	4			C9, C25, C28, C29, C31, C32, C35, C36, C44	
9	1,000	ST	22	BR357499	CAP. CER. 27P 100 G N150	4			C11	
10	2,000	ST	22	BR451053	CAP. ELEC 68J 6,3 M	4			C17, C30	
11	1,000	ST	22	BR392979	CAP. CER. 4N7 100 K	4			C18	
12	1,000	ST	22	BR448877	CAP. PLST 3N3 160 H	4			C22	
13	1,000	ST	22	BR448907	CAP. PLST 10N 160 F	4			C23	
14	1,000	ST	22	BR448915	CAP. PLST 12N 63 F	4			C24	
15	1,000	ST	22	BR209503	CAP. PLST 470N 100 K	4			C26	
16	1,000	ST	22	BR209554	CAP. PLST 10N 250 K	4			C27	
17	1,000	ST	22	BR454281	CAP. ELEC 1M 25 T	4			C38	
18	1,000	ST	22	BR344273	CAP. PLST 22N 250 K	4			C39	
19	1,000	ST	22	BR454303	CAP. ELEC 470J 16 T	4			C40	
20	1,000	ST	22	BR454117	CAP. PLST 68N 250 K	4			C41	
21	1,000	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	4			C48	
22	1,000	ST	22	BR385123	CAP. CER. 4N7 100 K HI-K	4			C49	
23	1,000	ST	22	BR357650	CAP. CER. 22N 63 A HI-K	4			C52	C3
24	9,000	ST	23	BR228087	D10 SIGN. 1N4148 SI 150MA	4			CR1, CR2, CR3, CR4, CR5, CR6, CR7, CR8, CR9	
25	5,000	ST	51	BR458694	SCREW M 2,5X 5 CHM CU SN	4			H1	
26	5,000	ST	51	BR276790	SCREW M 3 X 5 CHM CU SN	4			H2	
27	1,000	ST	51	BR276804	SCREW M 3 X 8 CHM CU SN	4			H3	
28	6,000	ST	52	BR327514	NUT M 3 CONTRA M CU SN	4			H4	
29	1,000	ST	24	BR362069	IC ACCESS HEATSINK	4			H5	
30	3,000	ST	26	BR391387	TRANS.ACCESS ISOLAT.PLD	4			H6	
31	4,000	ST	56	BR386677	BEAD, STEATITE 3.18X3.18	4			H7	C4
32	1,000	ST	45	BR354554	STRAP, CABLE LI91X83,6	4			H9	
33	8,000	ST	31	BR442399	TERMINAL STUD 140-1785-2	4			H10	

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark

TITLE:
REGULATOR ASSY A10A1

DOCUMENT NO.:

01 - BR448559
(448559)

REV:

D1

SHEET NO.:

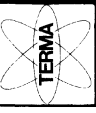
1 UF

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Parts List

PRINTED..... 91/05/23
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FIND NO.	QTY REQ	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
34	1,000	ST	31	BR458481	CONN MOLEX 11P MALE	4			J2	
36	1,000	ST	31	BR454168	CONN MOLEX 2P MALE	4			J4	
37	1,000	ST	41	BR458384	SCREEN SHIELD CAN A10A1	1			MP1	
38	1,000	ST	45	BR448095	RETAINER, PC 5X5X109 MM	2			MP2	
39	2,000	ST	52	BR455571	STAY NUT M2,5X15 Ø4,0-2,9	3			MP3	
40	7,000	ST	26	BR273899	TRANS. LOPOW BC 547B SI-N	4			Q2, Q10, Q13, Q14, Q15, Q16, Q18	
41	3,000	ST	26	BR454206	TRANS. SCR 2N6402 200V16A	4			Q3, Q6, Q11	
42	3,000	ST	26	BR359157	TRANS. LOPOW BC 251 SI-P	4			Q5, Q7, Q8	B
43	1,000	ST	26	BR454605	TRANS. JFETN 2N3955 DUAL T	4			Q12	
44	12,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R1, R3, R7, R8, R21, R23, R27, R28, R48, R49, R50, R120	D
45	3,000	ST	21	BR240494	RES CARB. 3K9 1/4J SFR25	4			R2, R22, R42	
46	6,000	ST	21	BR240524	RES CARB. 5K6 1/4J SFR25	4			R4, R5, R24, R25, R51, R52	
47	2,000	ST	21	BR240192	RES CARB. 51K 1/4J SFR25	4			R6, R26	
48	1,000	ST	21	BR328545	RES CARB. 220R 1/4J SFR25	4			R9	
49	3,000	ST	21	BR454184	RES WIREW OR1 4J	4			R10, R56, R57	
50	2,000	ST	21	BR240583	RES CARB. 12K 1/4J SFR25	4			R11, R18	
51	2,000	ST	21	BR240745	RES CARB. 100K 1/4J SFR25	4			R12, R88	
52	2,000	ST	21	BR240605	RES CARB. 15K 1/4J SFR25	4			R13, R62	
53	3,000	ST	21	BR369578	RES FILM 5K11 0,6F MRS25	4			R14, R15, R16	
54	3,000	ST	21	BR240311	RES CARB. 330R 1/4J SFR25	4			R17, R37, R63	
55	1,000	ST	21	BR324221	RES CARB. 2K4 1/4J SFR25	4			R20	
56	1,000	ST	21	BR359572	RES CARB. 110R 1/4J SFR25	4			R29	
57	2,000	ST	21	BR454192	RES WIREW OR22 4J	4			R30, R31	
58	1,000	ST	21	BR240613	RES CARB. 18K 1/4J SFR25	4			R32	
59	1,000	ST	21	BR458686	RES WIREW 4K7 4J	4			R33	
60	1,000	ST	21	BR372129	RES FILM 178K 0,6F MRS25	4			R35	
61	1,000	ST	21	BR376434	RES FILM 59K0 0,6F MRS25	4			R36	
62	1,000	ST	21	BR324183	RES CARB. 30K 1/4J SFR25	4			R38	
63	1,000	ST	21	BR240540	RES CARB. 6K3 1/4J SFR25	4			R39	
64	1,000	ST	21	BR240427	RES CARB. 1K5 1/4J SFR25	4			R40	
65	2,000	ST	21	BR240222	RES CARB. 100R 1/4J SFR25	4			R44, R53	
66	2,000	ST	21	BR240621	RES CARB. 22K 1/4J SFR25	4			R46, R116	
67	9,000	ST	21	BR240567	RES CARB. 10K 1/4J SFR25	4			R47, R58, R59, R60, R74, R94, R97, R100, R102	

TERMA Elektronik AS Dansk Radio Division DK-2630 Tåstrup, Denmark				TITLE: REGULATOR ASSY	A10A1	DOCUMENT NO: 61 - BR448559 (448559)	REV: D1	SHEET NO: 2 OF 4
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Parts List

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PARTS LIST PER.. 91/05/22

FIND NO.	QTY REQ	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
68	2,000	ST	21	BR240340	RES CARB. 470K 1/4J SFR25	4			R55,R104	
69	2,000	ST	21	BR380393	RES CARB. 270K 1/4J SFR25	4			R61,R83	
70	2,000	ST	21	BR240370	RES CARB. 620K 1/4J SFR25	4			R64,R82	
71	1,000	ST	21	BR240338	RES CARB. 390K 1/4J SFR25	4			R65	
72	4,000	ST	21	BR349623	RES FILM 10K0 0,6F MRS25	4			R66,R68,R78,R79	
73	1,000	ST	21	BR376566	RES FILM 8K25 0,6F MRS25	4			R67	
74	1,000	ST	21	BR405604	RES FILM 16K2 0,6F MRS25	4			R69	
75	5,000	ST	21	BR328626	RES CARB. 220K 1/4J SFR25	4			R70,R71,R72,R73,R87	
76	2,000	ST	21	BR240486	RES CARB. 3K3 1/4J SFR25	4			R75,R77	
77	1,000	ST	21	BR359165	RES SEMIV 10K 1/2K GERM	4			R76	
78	1,000	ST	21	BR454354	RES FILM 20K5 0,6F MRS25	4			R80	
79	3,000	ST	21	BR240702	RES CARB. 50K 1/4J SFR25	4			R81,R117,R118	
80	1,000	ST	21	BR324175	RES CARB. 30K 1/4J SFR25	4			R84	
81	1,000	ST	21	BR450251	RES NTC 15K K M822	4			R85	
82	1,000	ST	21	BR240664	RES CARB. 39K 1/4J SFR25	4			R89	
83	1,000	ST	21	BR240680	RES CARB. 47K 1/4J SFR25	4			R90	
84	5,000	ST	21	BR240451	RES CARB. 2K2 1/4J SFR25	4			R91,R95,R98,R99,R111	
85	2,000	ST	21	BR240397	RES CARB. 820K 1/4J SFR25	4			R92,R93	
86	4,000	ST	21	BR240419	RES CARB. 1K2 1/4J SFR25	4			R96,R101,R103,R113	
87	1,000	ST	21	BR240176	RES CARB. 43K 1/4J SFR25	4			R105	
88	1,000	ST	21	BR240257	RES CARB. 180K 1/4J SFR25	4			R106	
89	1,000	ST	21	BR364029	RES CARB. 2R2 1/4J SFR25	4			R107	
90	1,000	ST	21	BR240958	RES CARB. 1R0 1/2JSFR25H	4			R108	
91	1,000	ST	21	BR240559	RES CARB. 8K2 1/4J SFR25	4			R109	
92	1,000	ST	21	BR240478	RES CARB. 2K7 1/4J SFR25	4			R114	
93	12,000	ST	31	BR231304	TERMINAL STUD 2,5X7 Ø1,3	4			TP	
94	1,000	ST	24	BR451282	IC LIN LF 350N OP.AMP.	4			U1	
95	1,000	ST	24	BR451266	IC LIN LM 301A OP.AMP.	4			U2	
96	1,000	ST	24	BR454370	IC LIN 79MGU1 VOLT REGL.	4			U3	
97	1,000	ST	24	BR454222	IC LIN LM 324N 4X OP.AMP.	4			U4	
98	1,000	ST	24	BR451231	IC LIN LM 723C VOLT REGL.	4			U5	
99	1,000	ST	24	BR454230	IC LIN LM 3054N TRANS.ARR	4			U7	
100	1,000	ST	24	BR443964	IC LIN TDA2002 PUM. AMPL	4			U8	
101	2,000	ST	23	BR454389	D10 ZEN ZPD16 16V 0.5W	4			VR1,VR2	
102	2,000	ST	23	BR228842	D10 ZEN ZPD 5.6 5.6V 0.5W	4			VR4,VR5	
103	1,000	ST	23	BR228869	D10 ZEN ZPD 7.5 7.5V 0.5W	4			VR6	



TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark

TITLE:
REGULATOR ASSY

DOCUMENT NO.:
61 - BR448559
(448559)

REV:
D1

SHEET NO.:
3 OF 4

Parts List

PRINTER..... 91/05/23
PARTS LIST PER.. 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
104	1,000	ST	23	BR301488	DIU ZEN ZPD 3.9 3.9V 0.5M	4			VR8	D
105	1,000	ST	37	BR464902	FLATCABL.ASSY W1 A10	4			W1	
106	1,000	ST	22	BR203122	CAP. ELEC 100J 25	4			C14	B
107	1,000	ST	26	BR386758	TRANS. LOUW BC 327A SI-P	4			W17	B
108	1,000	ST	21	BR362913	RES CARB. 15R 1/4J SFR25	4			R121	B
109	1,000	ST	22	BR476315	CAP. PLST 680N 50 J	4			C50	B
110	1,000	ST	22	BR492841	CAP. ELEC 15J 16 M	4			C51	C
111	0,056	M	32	200843-009	WIRE COP TIN-CTD Ø0.6 MM	4				C1
112	0,048	M	34	205077-007	SLEEVING TEFLON VIOLET	4				C1
113	1,000	ST	24	BR462292	IC LIN TL 084 4X OP.AMP.	4			U6	C5
114	1,000	ST	21	BR240516	RES CARB. 4K7 1/4J SFR25	4			R119	D
115	1,000	ST	48	214073-004	LABEL. ADHESIVE, ESD	2				D1
*****	*****	*****	*****	*****	*** BILL OF DOCUMENTATION	*****	*****	*****	*****	*****
1001			PD	BR448559	REGULATOR ASSY A10A1					
1002			EC	BR448559	REGULATOR ASSY A10A1					
1006			AS	206460	ESD, PROTECTION & MARKING					
1007			AS	201350	WORKMANSHIP					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR448532	POWER SUP ASS A10 24/220V	1				

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark



TITLE:
REGULATOR ASSY A10A1

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Parts List

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PARTS LIST PER... 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR448567	PWB M3000A10A2	3				
2	1,000	ST	31	BR458368	TERMINAL ASSY A10A2A1	1			A1	
3	3,000	ST	22	BR385190	CAP. CER. 4N7 5KV M HI-K	4			C1,C2,C3	
4	1,000	ST	22	BR458511	CAP. PLST 100N 630 K	4			C4	
5	3,000	ST	22	BR209503	CAP. PLST 470N 100 K	4			C5,C6,C7	
6	2,000	ST	22	BR366471	CAP. ELEC 1M 40 T	4			C8,C22	
7	1,000	ST	22	BR357626	CAP. CER. 4N7 100 S HI-K	4			C9	
8	1,000	ST	22	BR454613	CAP. ELEC 10U 40 T	4			C10	
9	1,000	ST	22	BR459437	CAP. ELEC 330N 40 M	4			C11	
10	3,000	ST	22	BR450510	CAP. CER. 100N 63 S	4			C12,C19,C25	
11	5,000	ST	22	BR202967	CAP. PLST 100N 100 K	4			C13,C14,C17,C18,C23	
12	2,000	ST	22	BR358959	CAP. CER. 1N0 100 K	4			C15,C16	
13	1,000	ST	22	BR450529	CAP. ELEC 6U8 25 M	4			C20	
14	1,000	ST	22	BR454338	CAP. ELEC 4M7 40 T	4			C21	
15	1,000	ST	22	BR454311	CAP. ELEC 10M 25 T	4			C24	
16	4,000	ST	23	BR228141	DIO POW. 1N4007 SI 1KV 1A	4			CR1,CR5,CR9,CR10	
17	5,000	ST	23	BR228087	DIO SIGN. 1N4148 SI 150MA	4			CR2,CR3,CR4,CR16,CR17	
18	1,000	ST	23	BR487082	DIO SCHOT BYV1945 45V 10A	4			CR6	
19	2,000	ST	23	BR373524	DIO POW. MK 501 SI100V 3A	4			CR7,CR8	
20	3,000	ST	23	BR458732	DIO SCHOT 80SQ045 SI 45V	4			CR13,CR14,CR15	
21	5,000	ST	51	BR458694	SCREW M 2,5X 5 LHM CU SN	4			H1	A2
23	1,000	ST	51	BR446793	SCREW M 3 X10 CHN NYLON	4			H3	
24	1,000	ST	51	BR458295	SCREW M 5 X55 CHM CU SN	4			H4	
25	3,000	ST	51	BR276790	SCREW M 3 X 5 CHM CU SN	4			H5	A2
26	4,000	ST	31	BR465003	TERMINAL LUG 6,4MM	4			H6	
27	2,000	ST	45	BR354554	STRAP,CABLE L191XB3,6	4			H7	
28	2,000	ST	45	BR377716	STRAP,CABLE L371XB3,7	4			H8	
29	6,000	ST	45	BR371157	STRAP,CABLE L 92XB2,6	4			H9	
30	1,000	ST	52	BR327549	NUT M 5 M CU SN	4			H10	
31	4,000	ST	26	BR391387	TRANS.ACCESS ISOLAT.PLD	4			H11	
32	16,000	ST	31	BR442399	TERMINAL STUD 140-1785-2	4			H12	
33	2,000	ST	26	BR458546	TRANS.ACCESS ISOLATIONS	4			H13	
34	3,000	ST	51	BR450553	SCREW SELF TAP.2X1,4 PHPX-	4			H14	
35	3,000	ST	51	BR276804	SCREW M 3 X 8 CHM CU SN	4			H15	
36	8,000	ST	51	BR327220	SCREW M 4 X 8 CHM CU SN	4			H2,H16	A1
37	1,000	ST	52	BR327506	NUT M 3 M CU SN	4			H17	



TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark

TITLE:
TRAFU ASSY A10A2 220V

DOCUMENT NO:
25 - BR448575
(448575

REV:
A2

SHEET NO:
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Parts List

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FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
38	1,000	ST	51	BR327204	SCREW M 3 X25 CHM CU SN	4			H18	
39	1,000	ST	31	BR454168	CONN MOLEX 2P MALE	4			J2	
40	1,000	ST	33	BR454095	RELAY 24VDC 750 2XCHG.	4			K1	
41	2,000	ST	25	BR454125	COIL,CHOKE 25J 1,5A INS	4			L1,L2	
42	2,000	ST	25	BR487430	COIL,CHOKE 25U 6A	4			L3,L4	
43	1,000	ST	45	BR448095	RETAINER,PC 5X5X109 MM	2			MP1	
44	2,000	ST	52	BR458120	STAY NUT M4 X62 N7	3			MP2	
45	2,000	ST	52	BR458139	STAY NUT M4 X64 N7	3			MP3	
46	1,000	ST	35	BR458414	SHIELD PLATE A10A2 M 3000	1			MP5	
47	1,000	ST	56	BR458430	HEAT SINK A10A2 M 3000	1			MP6	
48	1,000	ST	45	BR458570	RETAINER BRACKET M 3000	1			MP7	
49	1,000	ST	52	BR372285	STAY NUT M3 X27 N5	3			MP8	
50	4,000	ST	26	BR359157	TRANS.LOPOW BC 251 SI-P T	4			Q1,Q2,Q3,Q4	
51	2,000	ST	26	BR454397	TRANS.DARLN BDX 53C SI-N	4			Q5,Q6	
52	2,000	ST	26	BR273899	TRANS.LOPOW BC 5+7B SI-N	4			Q7,Q8	
53	1,000	ST	21	BR454109	RES CARB. 8K2 1J CK68	4			R1	
54	1,000	ST	21	BR240605	RES CARB. 15K 1/4J SFR25	4			R2	
55	1,000	ST	21	BR240516	RES CARB. 4K7 1/4J SFR25	4			R3	
56	1,000	ST	21	BR240621	RES CARB. 22K 1/4J SFR25	4			R4	
57	2,000	ST	21	BR240540	RES CARB. 6K8 1/4J SFR25	4			R5,R17	
58	1,000	ST	21	BR240710	RES CARB. 68K 1/4J SFR25	4			R6	
59	1,000	ST	21	BR324191	RES CARB. 7K5 1/4J SFR25	4			R7	
60	2,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R8,R21	
61	1,000	ST	21	BR240222	RES CARB. 100R 1/4J SFR25	4			R9	
62	2,000	ST	21	BR240435	RES CARB. 1K8 1/4J SFR25	4			R10,R11	
63	2,000	ST	21	BR240451	RES CARB. 2K2 1/4J SFR25	4			R12,R14	
64	2,000	ST	21	BR454184	RES WIREW 0K1 4J	4			R13,R15	
65	1,000	ST	21	BR240494	RES CARB. 3K9 1/4J SFR25	4			R19	
66	1,000	ST	21	BR240478	RES CARB. 2K7 1/4J SFR25	4			R20	
67	1,000	ST	21	BR241520	RES CARB. 2K2 1/2JSFR25H	4			R22	
68	1,000	ST	25	BR454249	TRAF0,MAINS 110/110 2X9-1	4			T1	
69	2,000	ST	31	BR454214	TERMINAL BD 3P SCREW/PWB	4			T61	
70	11,000	ST	31	BR231304	TERMINAL STUD 2,5X7 Ø1,3	4			TP	
71	1,000	ST	24	BR433632	IC LIN MCA 255 OPTO ISUL	4			U1	
72	1,000	ST	24	BR375349	IC LIN 78L05 VOLT REGL.	4			U2	
73	1,000	ST	24	BR436895	IC LIN LM 555C TIMER	4			U3	

TERMA Elektronik AS
Dansk Radio Division
 DK-2630 Tåstrup, Denmark




TITLE:
 TRAF0 ASSY A10A2 220V

DOCUMENT NO.:
 25 - BR448575
 (448575)

REV: A2

SHEET NO.: 2 OF 3

Parts List

PRINTED..... 91/05/23
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FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
74	1,000	ST	24	BR404764	IC UGTL 74LS 73N 2X JK FF	4			U4	
75	1,000	ST	24	BR454362	IC LIN 78MGU1 VOLT REGL.	4			U5	
76	4,000	ST	23	BR454346	DIO ZEN. BZX87C75 75V 2W	4			VR1, VR2, VR5, VR6	
77	1,000	ST	23	BR361488	DIO ZEN ZPD 3.9 3.9V 0.5W	4			VR3	
78	1,000	ST	23	BR363324	DIO ZEN ZPD 5.1 5.1V 0.5W	4			VR4	
79	1,000	ST	23	BR487090	DIO ZEN. BZI03C39 39V 3W	4			VR7	
80	1,000	ST	37	BR458392	CABLE ASSY A10W2 M 3000	1			W2	A2
81	0,081	M	44	BR377503	EDGING KANTLIST F/2,1-3MM	4				
*****	*****	*****	*****	*****	***** BILL OF DOCUMENTATION *****	*****	*****	*****	*****	*****
			EC	BR448575	TRAFO ASSY A10A2 220V					
			PD	BR448575	TRAFO ASSY A10A2 220V					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR448532	POWER SUP ASS A10 24/220V	1				



TITLE:
TRAFO ASSY A10A2 220V

DOCUMENT NO.:
25 - BR448575
(448575

REV: A2

SHEET NO.: 3 OF 3


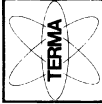
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Parts List

PRINTED..... 91/05/23
PARIS LIST PER... 91/05/22

FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR471364	PWB DISPL.RX4.	3				
2	2,000	ST	23	BR228087	DIO SIGN. 1N4148 SI 150MA	4			CR1,CR2	
3	3,000	ST	31	BR490458	CONN AMP MODU2 10P MALE	4			P1,P2,P3	
4	8,000	ST	26	BR369454	TRANS.DARLN MPSA13 SI-N T	4			Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q8	
5	2,000	ST	21	BR457655	RES NETW 4X3K3 1/5G	4			R1,R2	
6	1,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R3	
7	1,000	ST	21	BR324221	RES CARB. 2K4 1/4J SFR25	4			R4	
8	2,000	ST	21	BR462268	RES FILM 3K01 0.6F MRS25	4			R5,R6	
9	1,000	ST	21	BR433926	RES FILM 4K02 0.6F MRS25	4			R7	
10	1,000	ST	21	BR240567	RES CARB. 10K 1/4J SFR25	4			R8	
11	2,000	ST	21	BR240346	RES CARB. 470R 1/4J SFR25	4			K9,R10	
12	1,000	ST	21	BR324191	RES CARB. 7K5 1/4J SFR25	4			R11	
13	1,000	ST	21	BR240141	RES CARB. 27R 1/4J SFR25	4			K12	
14	7,000	ST	24	BR450499	IC DISPL. 5082-7740 7 SEG	4			U1,U2,U3,U4,U5,U6,U7	
15	2,000	ST	24	BR450502	IC DSPL HLMP2350 LGHT BAR	4			U8,U9	
16	1,000	ST	24	BR446327	IC LIN UAA 170 LED DRIVER	4			U15	
17	2,000	ST	24	BR474916	IC DSPL HDSP4820 LGHT BAR	4			U16,U17	
18	0,006 KG	KG	32	BR225487	WIRE,COP 0,+0MM TIN	4			W1,W2,W3,W4,W5,W6	
*****	*****	*****	*****	*****	*** BILL OF DOCUMENTATION	*****	*****	*****	*****	*****
			EC PD	BR448613 BR448613	DSPL BD ASSY A1A1A1 DSPL BD ASSY A1A1A1					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR477958	FR PAN CKT A1A1A1 M3000	1				

TERMA Elektronik AS
Dansk Radio Division
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TITLE:
DSPL BD A1A1A1 M3000

DOCUMENT NO.:
60 - BR448613
(448613

REV: A

SHEET NO.:
1 OF 1

Parts List										PRINTED..... 91/05/23 PARTS LIST PER... 91/05/22	
FIND NO.	QTY REQ	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV	
1	1,000	ST	37	BR448621	PWB M3000A12A1	3			C1,C2		
2	2,000	ST	22	BR393959	CAP. CER. 100N 50 M	4			H1		
3	18,000	ST	31	BR454419	CONN PWB ACCES CODE PIN	4					
4	0,250	M	31	BR459429	CONTACT STRIP 0,58X0,51N	4			H2		
5	1,000	ST	21	BR240451	RES CARB. 2K2 1/4J SFR25	4			R6		
6	5,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25	4			R7,R8,R9,R12,R13		
7	1,000	ST	21	BR451371	RES NETW 9X2K2 1/5G	4			R10		
8	1,000	ST	21	BR451363	RES NETW 5X2K2 1/5G	4			R11		
9	2,000	ST	24	BR451606	IC DGTL 74LS245N 8 BIT TR	4			U1,U2		
10	1,000	ST	24	BR404551	IC DGTL 74 37N 4X21N NAND	4			U3		
11	9,000	ST	31	BR451509	CONN PWB EDGE 36P FEMALE	4			XA1,XA2,XA3,XA4,XA6,XA7, XA8,XA9,XA10		
*****	*****	*****	*****	*****	*** BILL OF DOCUMENTATION	*****	*****	*****	*****	*****	
			EC PD	BR448648 BR448648	MOTHERBD ASSY A12A1 MOTHERBD ASSY A12A1						
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****	
	1,000	ST		BR457833	CHASSIS ASSY A12 M3000	1					
TERMA Elektronik AS Dansk Radio Division DK-2630 Tåstrup, Denmark					TITLE: MOTHERB ASSY A12A1 M3000	DOCUMENT NO.: 60 - BR448648 (448648		REV: A	SHEET NO.: 1 1 UF	1	

Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR455482	PWB,VCD A1A1	3				
2	7,000	ST	22	BR358959	CAP. CER. 1N0 100 K	4			C17,C18,C21,C23,C24,C25,C26	
3	1,000	ST	22	BR455148	CAP. CER. 18P 63 J N150	4			C19	
4	1,000	ST	22	BR455121	CAP. CER. 10P 63 J N150	4			C20	
5	1,000	ST	22	BR450855	CAP. CER. 47P 63 J N150	4			C22	
6	4,000	ST	23	BR358614	DIO SWITCH 6A 482 SI 100MA	4			CR13,CR14,CR15,CR16	
7	1,000	ST	23	BR405531	DIO CAP.BB204B SI 37-42PF	4			CR17	
8	1,000	ST	23	BR228087	DIO SIGN. IN4148 SI 150MA	4			CR22	
9	3,000	ST	22	BR436976	CAP. CER. 100N 100 M	4			C109,C110,C111	
10	4,000	ST	51	BR458287	SCREW M 2,5X 8 GHM CU SN	4			H1	
11	7,000	ST	31	BR231304	TERMINAL STUD 2,5X7 Ø1,3	4			H2	
12	1,000	ST	26	BR218952	TRANS.ACCESS PAD TU-18	4			H3	
13	1,000	ST	25	BR455237	COIL A1A1 L1	1			L1	
14	1,000	ST	25	BR357820	COIL,CHOKE 202 K	4			L2	
16	4,000	ST	52	BR396834	STAY NUT M2,0X15,5 Ø3,9/Ø	3			MP2	
17	1,000	ST	26	BR455229	TRANS.MFETN MFE131 2XG TO	4			Q22	
18	2,000	ST	21	BR455210	RES FILM 604K 0,6F MRS25	4			R44,R45	
19	1,000	ST	21	BR359335	RES FILM 78K7 0,6F MRS25	4			R46	
20	1,000	ST	21	BR349585	RES FILM 56K2 0,6F MRS25	4			R47	
21	2,000	ST	21	BR371033	RES FILM 100R 0,6F MRS25	4			R48,R49	
22	1,000	ST	21	BR349674	RES FILM 15K0 0,6F MRS25	4			R149	
23	2,000	G	78	BR401773	SPINNER PLAST 2000	4				A1
*****	*****	*****	*****	*****	*** BILL OF DOCUMENTATION	*****	*****	*****	*****	*****
			PD	BR448168	SYNTHESIZER A1					
			TP	BRQA4411	VCD A1A1 RX4000 A1 SYNTH.					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR448168	SYNTHESIZER A1 STANDARD	1				


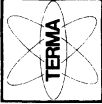
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Parts List

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PARIS LIST PER... 91/05/22

FIND NO.	QTY REQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	60	BR477958	FR PAN CKT ALLAL M3000	1			A1	
2	4,000	ST	51	BR458694	SCREW M 2,5X 5 CHM CU SN	4			H1	
3	8,000	ST	51	BR276790	SCREW M 3 X 5 CHM CU SN	4			H2	
4	4,000	ST	51	BR450545	SCREW M 5 X12 UHK	4			H3	
5	8,000	ST	51	BR475785	SCREW SELF TAP. 2X11/8 PHPX-	4			H4	
6	1,000	ST	52	BR321486	NUT M10F 10X14X3MM	4			H5	A4
7	8,000	ST	53	BR245674	WASHER,NYLON Ø10MM	4			H6	
8	2,000	ST	51	BR403342	SCREW PINOL M 3 X 6 R UNB	4			H7	
9	1,000	ST	43	BR454443	KNOB Ø10MM BLCK	4			H8	
10	1,000	ST	43	BR454435	KNOB,CAB 3,3X Ø7,2	4			H9	
11	1,000	ST	43	BR454494	KNOB 20X Ø36	4			H10	
12	1,000	ST	43	BR454486	KNOB,CAB 6X Ø30,3	4			H11	
13	3,000	ST	43	BR454478	KNOB 17X Ø14,5	4			H12	
14	3,000	ST	43	BR454451	KNOB,CAB 4,8X Ø11	4			H13	
15	1,000	ST	53	BR230278	WASHER, LOCK Ø 5MM X0,7MM	4			H14	
16	2,000	ST	45	201197-049	STRAP, CABLE, NAT 16X2,5	4				A3
19	1,000	ST	53	BR402923	WASHER, FLAT Ø10MM GULCR J	4			H18	
20	0,260	M	34	BR490075	TAPE, DOUBLE SIDE 0,13X10	4			H20	
21	1,000	ST	31	BR454575	CONN JACK CHAS 2P FEMALE	4			J1	
22	2,000	ST	43	BR216674	HANDLE F.5 1/4" 111MM	3			MP1	
23	4,000	ST	51	BR260827	THUMBSCREW, KNURLED M6	3			MP2	
24	4,000	ST	46	BR268682	GUIDE F/THUMBSCREW 260827	2			MP3	
25	1,000	ST	41	BR460257	FRONT PLATE CUL.130 M3000	1			MP4	
26	1,000	ST	46	BR457922	GUIDE SHEET M 3000 A11	1			MP5	
27	2,000	ST	46	BR445827	BRACKET,FRONTPLATE A11	1			MP6	
28	1,000	ST	57	BR458015	BUSHING,PILOT A11	3			MP7	
29	1,000	ST	57	BR459305	BUSHING,PILOT M 3000 A11	3			MP8	
30	1,000	ST	42	BR457728	CODE WHEEL A11	1			MP9	
31	1,000	ST	42	BR458023	FLY WHEEL A11	3			MP10	
32	1,000	ST	42	BR458007	SHAFT F/CODE WHEEL A11	3			MP11	
33	1,000	ST	41	BR457957	SCREEN A11	1			MP12	
34	4,000	ST	53	BR267015	WASHER,NYLON Ø12MM X15MM	3			MP13	
35	1,000	ST	60	BR490407	USPL WINDOW M3000	3			MP14	
37	1,000	ST	21	BR454516	RES VAR. 10K CERM LIN	4			R1	
38	2,000	ST	21	BR454508	RES VAR. 1K0 CERM LIN	4			R2,R3	
39	1,000	ST	21	BR459313	RES VAR. 4K7 A11R4	1			R4	
TITLE: FRONT PANEL M 3000 A11					DOCUMENT NO.: 60 - BR457825 (457825)				REV: A4	SHEET NO.: 1 OF 2

TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark





TERMA Elektronik AS
Dansk Radio Division
DK-2630 Tåstrup, Denmark

Parts List

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FIND NO.	QTY RQD	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
40	1,000	ST	24	BR377538	RES CARB. 30R 1/4J SFR25	4			R5	
41	1,000	ST	37	BR458937	CABLE ASSY W1 A11	1			W1	
42	1,000	ST	37	BR458945	CABLE ASSY W2 A11	1			W2	
43	1,000	ST	37	BR458953	CABLE ASSY W3 A11	1			W3	A1
44	1,000	ST	53	BR499161	WASHER, PS7X13X0.1	4				A2
45	8,000	ST	53	221387-135	WASHER LOCK 2.8X5.3X0.6MM	4				
*****	*****	*****	*****	*****	*** BILL OF DOCUMENTATION	*****	*****	*****	*****	*****
			PD	BR457825	FRONT PANEL M3000					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR465429	M3000/TCXO/INCL. DUPLEX	1				

TERMA Elektronik AS Dansk Radio Division DK-2630 Tåstrup, Denmark	 	TITLE: FRONT PANEL M 3000 A11	DOCUMENT NO.: 00 - BR457825 (457825	REV: A4	SHEET NO.: 2 OF 2
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Parts List

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FIND NO.	QTY REQ	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	60	BR448048	MUTHERB ASSY AL2A1 M3000	1			A1	
2	16,000	ST	52	BR450588	NUT M 3 SQUARE 3X7X2,2MM	4			H2	
3	12,000	ST	51	BR276723	SCREW M 3 X 8 UHM CU SN	4			H3	
4	4,000	ST	51	BR430909	SCREW UNBRK M 3X 8 UHR	4			H4	
5	40,000	ST	51	BR450501	SCREW SELFTAP.4X3/8 PH-PL	4			H5	
6	20,000	ST	51	BR276790	SCREW M 3 X 5 UHM CU SN	4			H6	
7	12,000	ST	51	BR495239	SCREW M 4 X 4 UHJ Z	4			H7	
8	1,000	ST	41	BR448001	PLATE, JUNCTION M 3000	1			MP1	
9	5,000	ST	41	BR445886	PROFILE, PC IM	3			MP2	
10	2,000	ST	41	BR445894	PROFILE, PC IM DRILL	3			MP3	
11	3,000	ST	41	BR445908	PROFILE, PC 1,5M	3			MP4	
12	2,000	ST	41	BR445940	PROFILE, SIDE DRILL.	3			MP5	
13	2,000	ST	41	BR458600	RAIL SECTION A12	1			MP6	
14	6,000	ST	41	BR495026	SPLICE-PIECE A12	1			MP7	
15	10,000	ST	52	BR387681	STAY NUT M5 X10 N5	3			MP8	
16	16,000	ST	51	BR333417	SCREW M 4 X10 UHJ GULCR	4			H8	B
17	5,000	ST	46	BR497266	BRACKET FOR IM PROFILE	2			MP9	B
18	3,000	ST	46	BR497274	BRACKET FOR 1,5M PROFILE	2			MP10	B
19	8,000	ST	46	BR497282	FISHPLATE A12	2			MP11	B
20	12,000	ST	53	221387-135	WASHER LOCK 2.8X5.3X0.6MM	4				B1
21	0,200	ST	48	210757-001	LABELS FOR A10	2				C
*****	*****	*****	*****	*****	*** BILL OF DOCUMENTATION	*****	*****	*****	*****	*****
			PD	BR457833	CHASSIS ASSY A12					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR465429	M3000/TCXO/INCL. DUPLEX	1				
TERMA Elektronik AS Dansk Radio Division DK-2630 Tåstrup, Denmark					TITLE: CHASSIS ASSY A12 M3000		DOCUMENT NO: 41 - BR457833 (457833)		REV: C	SHEET NO: 1 OF 1


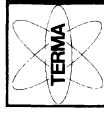


Parts List

PRINTED..... 91/05/23
PARTS LIST PER... 91/05/22

FIND NO.	QTY REQ	U M	CL NO.	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37	BR471437	PWB,FRONT PANEL CIR AL1A1	3				
2	1,000	ST	60	BR448613	DSPL BD AL1A1A1 M3000	1			A1	
3	4,000	ST	22	BR209805	CAP. TAN. 6U3 35 S	4			C1,C3,C5,C15	
4	5,000	ST	22	BR399959	CAP. CER. 100N 50 M	4			C2,C4,C6,C8,C11	
5	4,000	ST	22	BR450510	CAP. CER. 100N 63 S	4			C7,C9,C10,C19	
6	1,000	ST	22	BR451053	CAP. ELEC 68U 6,3 M	4			C12	
7	1,000	ST	22	BR203378	CAP. TAN. 10U 16 S	4			C13	
8	1,000	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	4			C14	
9	1,000	ST	22	BR450529	CAP. ELEC 6U8 25 M	4			C16	
10	2,000	ST	22	BR357650	CAP. CER. 22N 63 A HI-K	4			C17,C18	
11	15,000	ST	23	BR450480	DIO LED HLMP1000 RED Ø3	4			CR1,CR2,CR3,CR4,CR5,CR6,CR7,CR8,CR9,CR10,CR11,CR12,CR13,CR14,CR15CR16,CR17	
12	2,000	ST	23	BR228087	DIO SIGN. 1N4148 SI 150MA	4			HI	
13	2,000	ST	51	BR465402	SCREW M 2,5X 6 CHM CU SN	4			H1	
14	20,000	ST	51	BR276790	SCREW M 3 X 5 CHM CU SN	4			H2	
15	1,000	ST	51	BR276804	SCREW M 3 X 8 CHM CU SN	4			H3	A3
16	28,000	ST	53	BR380105	WASHER,FLAT Ø 3MM CU SN M	4			H4	A2
17	2,000	ST	53	BR321540	WASHER,FLAT Ø 2,5 M CU SN	4			H5	
18	1,000	ST	52	BR327506	NUT M 3 M CU SN	4			H6	
19	2,000	ST	52	BR375209	NUT M 2,5 M CU SN	4			H7	
21	1,200	M	32	BR220140	FLEX SILICONE 0,5/1 TRAN	4			H9	A3
22	1,000	ST	26	BR452688	TRANS.ACCESS TALLFJEDER	4			HI0	
23	10,000	ST	51	BR494380	SCREW M 3 X 4 CHM CU SN	4			HI1	
24	3,000	ST	25	BR363944	COIL,CHOKE HF WIDE BAND	4			L1,L2,L3	
25	1,000	ST	43	BR458961	KNOB,BLK,WHT.TEXT "SLOW"	3			MP1	
26	1,000	ST	43	BR458988	KNOB,BLK,WHT.TEXT "INTER"	3			MP2	
27	1,000	ST	43	BR458996	KNOB,BLACK,WHT.TEXT "AM"	3			MP3	
28	1,000	ST	43	BR459003	KNOB,BLACK,WHT.TEXT "BFO"	3			MP4	
29	1,000	ST	43	BR459011	KNOB,WHITE,BLK.TEXT "9"	3			MP5	
30	1,000	ST	43	BR459038	KNOB,WHITE,BLK.TEXT "6"	3			MP6	
31	1,000	ST	43	BR459046	KNOB,WHITE,BLK.TEXT "3"	3			MP7	
32	1,000	ST	43	BR474959	KNOB,WHITE,BLK.TEXT "C"	3			MP8	
33	1,000	ST	43	BR459062	KNOB,BLACK,WHT.TEXT "ATT"	3			MP9	
34	1,000	ST	43	BR459070	KNOB,BLK,WHT.TEXT "VNAR"	3			MP10	
35	1,000	ST	43	BR459089	KNOB,BLACK,WHT.TEXT "CW"	3			MP11	

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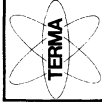
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36	1,000	ST	43	BR459097	KNØB, BLK, WHT. TEXT "SCAN"		3			MP12	
37	1,000	ST	43	BR459100	KNØB, WHITE, BLK. TEXT "7"		3			MP13	
38	1,000	ST	43	BR459119	KNØB, WHITE, BLK. TEXT "4"		3			MP14	
39	1,000	ST	43	BR459127	KNØB, WHITE, BLK. TEXT "1"		3			MP15	
40	1,000	ST	43	BR459135	KNØB, WHITE, BLK. TEXT "0"		3			MP16	
41	1,000	ST	43	BR459143	KNØB, BLACK, WHT. TEXT "OFF"		3			MP17	
42	1,000	ST	43	BR459151	KNØB, BLK, WHT. TEXT "WIDE"		3			MP18	
43	1,000	ST	43	BR459178	KNØB, BLACK, WHT. TEXT "SSB"		3			MP19	
44	1,000	ST	43	BR459186	KNØB, BLACK, WHT. TEXT "RCL"		3			MP20	
45	1,000	ST	43	BR459194	KNØB, BLACK, WHT. TEXT "STU"		3			MP21	
46	1,000	ST	43	BR459208	KNØB, RED, WHT. TEXT "500"		3			MP22	
47	1,000	ST	43	BR459216	KNØB, RED, WHT. TEXT "2182"		3			MP23	
48	1,000	ST	43	BR459224	KNØB, BLK, WHT. TEXT "FAST"		3			MP24	
49	1,000	ST	43	BR459232	KNØB, BLK, WHT. TEXT "NARR"		3			MP25	
50	1,000	ST	43	BR459240	KNØB, BLK, WHT. TEXT "RITY"		3			MP26	
51	1,000	ST	43	BR459259	KNØB, BLK, WHT. TEXT "TUNE"		3			MP27	
52	1,000	ST	43	BR459267	KNØB, WHITE, BLK. TEXT "8"		3			MP28	
53	1,000	ST	43	BR459275	KNØB, WHITE, BLK. TEXT "5"		3			MP29	
54	1,000	ST	43	BR459283	KNØB, WHITE, BLK. TEXT "2"		3			MP30	
55	1,000	ST	43	BR459291	KNØB, WHITE, BLK. TEXT "1"		3			MP31	
56	1,000	ST	46	BR448117	GUIDE SHEET 1 ALL		1			MP32	
57	1,000	ST	46	BR448125	GUIDE SHEET 2 M 3000 ALL		1			MP33	
58	8,000	ST	52	BR453129	STAY NUT M3 X 7 N5		3			MP34	
59	6,000	ST	56	224537-009	SPACER, THREADED M3 X15MM		4			MP36	
60	8,000	ST	52	BR460338	STAY NUT M3 X13,3 N5		3			MP37	
61	11,000	ST	26	BR392839	TRANS. LOPOW 2N2907A SI-P		4			Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q10, Q16, Q17	A1
62	1,000	ST	26	BR362980	TRANS. HIPOW MJE3055 SI-N		4			Q9	
63	3,000	ST	26	BR369454	TRANS. DARLN MPSA13 SI-N		4			Q11, Q12, Q13	
64	1,000	ST	26	BR399914	TRANS. JFETN J 309 IO-92		4			Q14	
65	1,000	ST	26	BR392820	TRANS. LOPOW 2N2222A SI-N		4			Q15	
66	2,000	ST	26	BR273899	TRANS. LOPOW BC 547B SI-N		4			Q18, Q19	
67	6,000	ST	21	BR240400	RES CARB. 1K0 1/4J SFR25		4			R1, R42, R45, R46, R49, R52	
68	1,000	ST	21	BR457663	RES NETW 8X1K5 1/4G		4			R2	
69	1,000	ST	21	BR457647	RES NETW 9X10K 1/5G		4			R3	
70	8,000	ST	21	BR241040	RES CARB. 15R 1/2JSFR25H		4			R4, R5, R6, R7, R8, R9, R10, R11	



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Parts List											PRINTED..... 91/05/23 PARTS LIST PER., 91/05/22			
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71	1,000	ST	21	BR240419	RES CARB. 1K2 1/4J SFR25	4			R12					
72	1,000	ST	21	BR240613	RES CARB. 18K 1/4J SFR25	4			R13					
73	3,000	ST	21	BR324221	RES CARB. 2K4 1/4J SFR25	4			R14,R47,R50					
74	1,000	ST	21	BR240702	RES CARB. 56K 1/4J SFR25	4			R15					
75	3,000	ST	21	BR240516	RES CARB. 4K7 1/4J SFR25	4			R16,R17,R19					
76	1,000	ST	21	BR457639	RES NETW 7X4K7 1/5G	4			R18					
77	3,000	ST	21	BR240486	RES CARB. 3K3 1/4J SFR25	4			R20,R21,R22					
78	1,000	ST	21	BR451355	RES NETW 5X1K0 1/5G	4			R23					
79	1,000	ST	21	BR433470	RES NETW 9X1KJ 1/5G	4			R24					
80	1,000	ST	21	BR457671	RES NETW 8X15K 1/4G	4			R25					
81	1,000	ST	21	BR349674	RES FILM 15K0 0.6F MRS25	4			R26					
82	8,000	ST	21	BR368539	RES FILM 7K50 0.6F MRS25	4			R27,R28,R29,R30,R31,R32, R33,R34					
83	1,000	ST	21	BR240745	RES CARB. 100K 1/4J SFR25	4			R35					
84	1,000	ST	21	BR240605	RES CARB. 15K 1/4J SFR25	4			R36					
85	1,000	ST	21	BR240338	RES CARB. 390R 1/4J SFR25	4			R37					
86	5,000	ST	21	BR240567	RES CARB. 10K 1/4J SFR25	4			R38,R43,R44,R53,R54					
87	1,000	ST	21	BR324205	RES CARB. 5K1 1/4J SFR25	4			R39					
88	2,000	ST	21	BR240621	RES CARB. 22K 1/4J SFR25	4			R48,R51					
89	31,000	ST	33	BR450421	SW,PUSH BU.SPST NO	4			S1,S2,S3,S4,S5,S6,S7,S8, S9,S10,S11,S12,S13,S14, S15,S16,S17,S18,S19,S20, S21,S22,S23,S24,S25,S26, S27,S28,S29,S30,S31					
90	1,000	ST	24	BR488127	IC DGTL 74HCT138 3-8 DECU	4			U1					
91	1,000	ST	24	BR488011	IC DGTL 74HCT 02 4X2IN NO	4			U2					
92	3,000	ST	24	BR362131	IC DGTL 74 06N 6X INV-BUF	4			U3,U10,U12					
93	1,000	ST	24	BR488062	IC DGTL 74HCT 14 6XINV.ST	4			U4					
94	1,000	ST	24	BR488208	IC DGTL 74HCT373 8XD-LATC	4			U5					
95	1,000	ST	24	BR450294	IC LIN 1L 082CP OP.AMP.	4			U6					
96	2,000	ST	24	BR488151	IC DGTL 74HCT164 SHIFT RE	4			U7,U8					
97	1,000	ST	24	BR488178	IC DGTL 74HCT240 8XBUF.IN	4			U9					
98	1,000	ST	24	BR365874	IC DGTL 74LS 74N 2X D FF	4			U11					
99	1,000	ST	24	BR473928	IC HYBRID OPB822SD OPTO S	4			U13					
100	1,000	ST	37	BR459550	FLATCABL.ASSY W1 ALL	3			W1					
101	3,000	ST	31	BR451479	CONN AMP MODU2 10P FEMALE	4			XP1,XP2,XP3					
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102	1,000	ST	48	214073-004	LABEL, ADHESIVE, ESD	2				B
103	1,000	G	78	200799-001	COMPOUND, THERMAL, SILICONE	4				B
104	12,000	ST	26	BR218952	TRANS, ACCESS PAD TU-18	4				B
*****	*****	*****	*****	*****	***** BILL OF DOCUMENTATION *****	*****	*****	*****	*****	*****
			EC PU	BR477958 BR477958	FRONT PANEL CKT ALLAI FRONT PANEL CKT ALLAI					
*****	*****	*****	*****	*****	***** NEXT ASSY *****	*****	*****	*****	*****	*****
	1,000	ST		BR457825	FRONT PANEL M 3000 ALL	1				

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SECTION 7

MANUAL CHANGES

This section contains information for correcting manual errors and for adapting the manual to equipment containing improvements made after the printing of the manual or to equipment containing options.

SECTION 8

SERVICE

8.1 Introduction

This section provides information for servicing the receiver.

8.2 Theory of Operation

The overall theory of operation is explained beginning with paragraph 8.11. Each paragraph explains with the aid of block diagrams the operation of functional assemblies.

Detailed theory of operation is located opposite the schematics.

8.3 Troubleshooting

WARNING

Read the Safety Summary at the front of this manual before troubleshooting the receiver.

By the use of front-panel controls, note as many symptoms of the malfunction as possible. From these symptoms it can usually be determined which assembly is malfunctioning. The Self-Test Program and the Fault Analysis Table (table 8.2b) can be used as a guide.

When a problem has been isolated to a particular assembly or circuit, the faulty component(s) may be located using the detailed theory of operation shown on the page opposing the appropriate schematic.

8.4 Self-Test Program

Receiver Test Program.

The built-in test program goes through the following sequence:

- a) Assembly test. The μ P addresses the individual interface circuits to see whether they are present. If an assay does not acknowledge the call, the μ P displays e.g. "A3 FAIL" and then continues the test.
- b) Synthesizer lock test. The synthesizer is set up near the boundaries of the VCO ranges, which are equivalent to the receiving frequencies 0, 6⁻, 6⁺, 12⁻, 12⁺, 20⁻, 20⁺ and 29.99999 MHz. If the synthesizer does not lock up within 100 msec., the display shows "OSC 1 Err".
- c) Gain test. The synthesizer is set to 75 MHz and the feed-through in the signal path is measured at the AGC to be above a reasonable level.

Also the presence of audio output from the detector is examined. The test is repeated with different BFO frequencies and crystal filters. If the BFO does not lock up, the display shows "OSC 3 Err" followed by "no Audio".

If the BFO level is low or an error is present in the AGC or the detector, the display shows "no Audio".

If the gain in the signal path is low, or the synthesizer level or 73.6 MHz oscillator level is low, the display shows "GAin Lo".

E.g. a fault in one of the crystal filters or in an interconnecting cable will result in "GAin Lo". An AGC fault can also cause this readout.

- d) Sensitivity test, only with pre-selector. The receiver is set to 4MHz, AM, Wide and noise is generated in the preselector. The AGC voltage is measured to be above a reasonable level. If the sensitivity is more than ca. 20dB worse than spec., the display shows "SEnS LO".

Faults in the preselector itself may not be discovered in this test.

- e) Display test. All LED's are lit.
- f) The software version number is displayed.
- g) Key test. Pressing any key but "C" results in the hexadecimal value of the key being shown. See table 8.2a.

8.5 Preventive Maintenance

Painted surfaces can be cleaned with a commercial, spray-type window cleaner or with a mild soap and water solution.

CAUTION

Avoid the use of chemical cleaning agents that might damage the plastics used in this receiver.

The pushbutton switches in this receiver were designed for long, trouble-free service. If one of these switches should become defective, replacement rather than repair is recommended.

8.6 Front Panel Assembly Removal

To remove the front panel assembly proceed as follows:

- a. remove the preselector knob on the front panel by lifting off the knob hat and unscrew the knob.
- b. remove the four screws holding the front panel. The four screws are located at the exterior side of the receiver side profiles.
- c. carefully withdraw the front panel assembly and disconnect the ribbon cable connector from the motherboard.

- d. to reinstall the front panel assembly, reverse removal procedure, carefully aligning the preselector shaft through the front panel bushing.

8.7 PC-Board Assembly Removal.

To remove a pc-board assembly proceed as follows:

- a. Disconnect the regulation transistor cable from A10J2 and remove the power supply heat sink panel by removing the four screws holding the panel. The four screws are located on the exterior side of the receiver side profiles.
- b. Disconnect all cables running to the concerned assembly.
- c. In the case of removing the Preselector A4, remove the preselector knob on the front panel by lifting of the knob hat and unscrew the knob.
- d. Remove the six (eight) screws positioned at the edge of the concerned assembly rear panel and withdraw the assembly. If the assembly is stuck in the chassis frame, it may be necessary carefully to release the assembly by keying a screwdriver in between the rear panel and the main frame.
- e. To reinstall the assembly, reverse removal procedure, carefully aligning the preselector shaft through the front panel bushing (only valid for A4).

Due to the use of self tapping screws holding the assembly rear panel to the chassis frame, carefully reinsert the screws in the threads when reversing step d above.

8.8 Servicing PC-Boards

All the pc-boards have plated-through component holes. This allows components to be removed or replaced by unsoldering or soldering from either side of the board. When removing large components, rotate the soldering iron tip from lead to lead while applying pressure to the part to lift it from the board.

8.9 MOS Handling Precautions

All MOS devices are subject to damage from static charge buildup. The generation of static charges is not a problem, but the accumulation of static charges is. In general, any device not connected directly to ground can accumulate static charges. Electrical discharge can occur to ground or to any object or person having a lower potential. Therefore, handling precautions are recommended for all personnel coming into contact with MOS devices.

When handling or testing MOS devices, observe the following precautions:

a. Ground test equipment and tools used

in testing or handling MOS devices.

b. Apply no power to board assembly while MOS device is being installed. This permits accumulated static charges on MOS device to be safely removed before power is applied.

c. When not in use, short all MOS leads. This prevents voltage differences from occurring on leads.

WARNING

When accomplishing step d, never expose personnel directly to hard electrical ground. For safety reasons, resistance of at least 100 Kohms should be placed between using personnel and hard electrical ground.

d. Do not handle MOS devices by their leads. Before handling any MOS device, personnel should touch electrical ground to discharge accumulated static charges.

e. Avoid use of plastics, rubber, and silk in MOS areas. Do not use any material susceptible to static charge accumulation.

f. Handle circuit boards and modules containing MOS devices in the same manner as individual MOS devices. Regardless of configuration, whenever leads of MOS devices are exposed, damage due to static-charge buildup can occur.

- g. Use conductive, grounded table tops in MOS work area.
- h. Humidity in work area should be maintained above 50%. Static charge generation increases exponentially as relative humidity decreases.

8.10 Logic Devices

This receiver uses three different families of logic circuits: MOS, TTL and ECL. Most of the logic devices used in this receiver are TTL and are represented by unmarked logic symbols on the schematics. Logic elements, not of the TTL Logic family, are so indicated on the schematics. Table 8.1 below lists typical voltage levels associated with each family used in this receiver.

Table 8.1 Typical logic levels

Logic Family	High Level	Low Level
TTL	3 - 5V	0.2V
ECL	4.3 to 4.7V	3.4 to 3.7V
MOS	5 - 15V	0V

8.11 Basic Principles of Operation

The following paragraphs contain functional descriptions keyed to the block diagrams. The block diagrams are drawn for function and do not show circuit details. Schematic and detailed descriptions of each circuit are located on subsequent service sheets.

8.12 Overall Operation

The overall functional block diagram of the receiver is shown in Figure 8.1

The antenna signal is connected to the Preselector Assembly A4, which serves two objects, matching the antenna impedance and rejecting unwanted signals. Duplex filters, designed for the maritime duplex bands, may be incorporated in the Preselector Assembly (Option 003). A built-in noise generator ensures preselector tuning in absence of input signals.

From A4 the filtered signal is routed to the Front-end Assembly A3, where the signal is up-converted to the first intermediate frequency at 75 MHz and crystal filtered to approx. 12 kHz. Following the first AGC-amplifier, the signal is then down-converted to the second intermediate frequency at 1.4 MHz and crystal filtered to the final information bandwidth.

The 1.4 MHz signal is then routed to the IF/AF assembly A7, where final amplification with subsequent SSB/CW or AM demodulation is performed. An AGC-leveled IF output is accessible at the rear panel of the assembly.

The Power Supply Assembly A10, incorporates AF notch filter and output amplifier for driving the operators headphone or loudspeaker. The Power Supply Assembly accepts both 110/220 Vac and 24 Vdc supply through the use of a floating inverter circuit. During mains drop-out the battery supply is automatically selected.

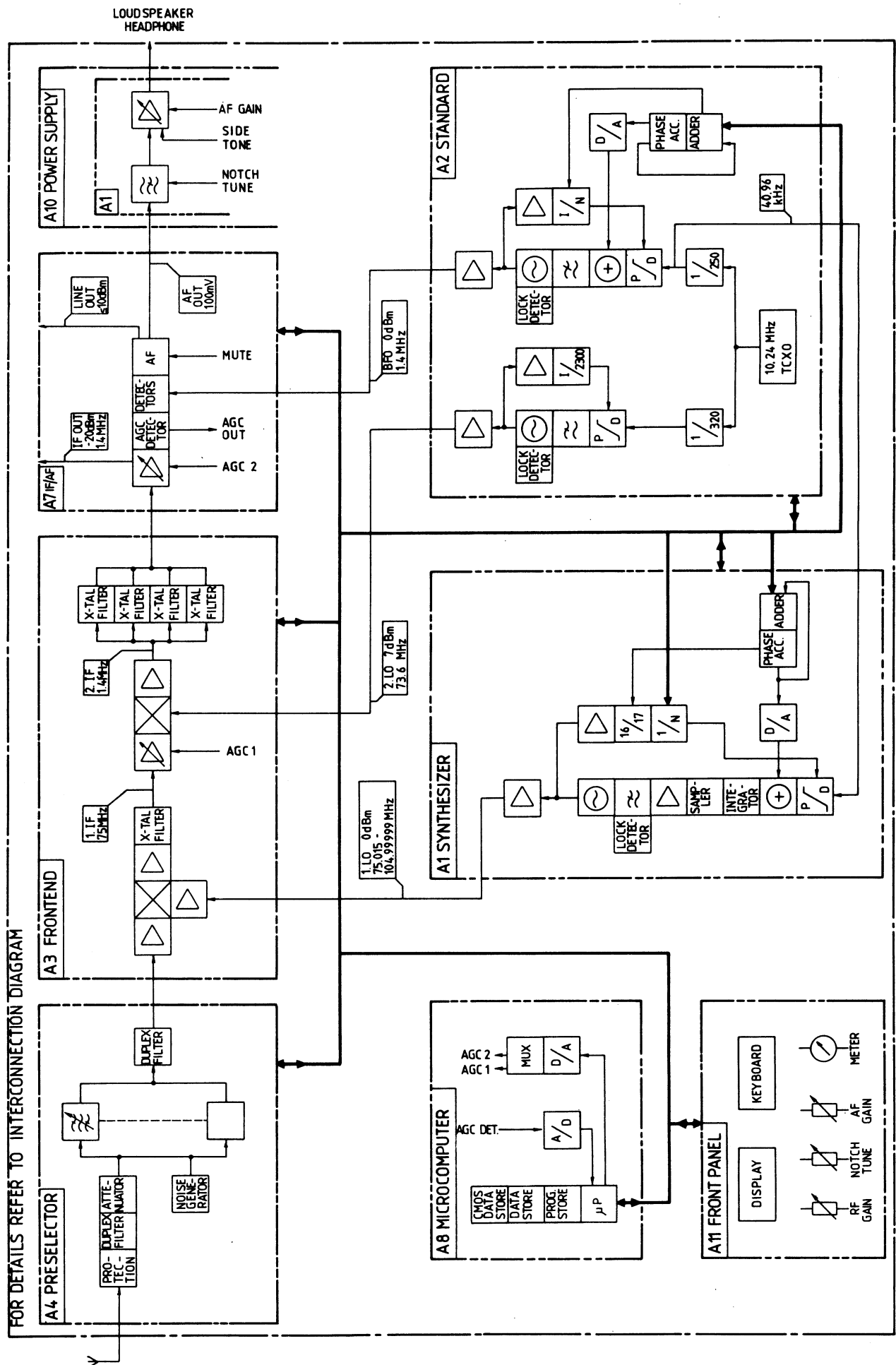
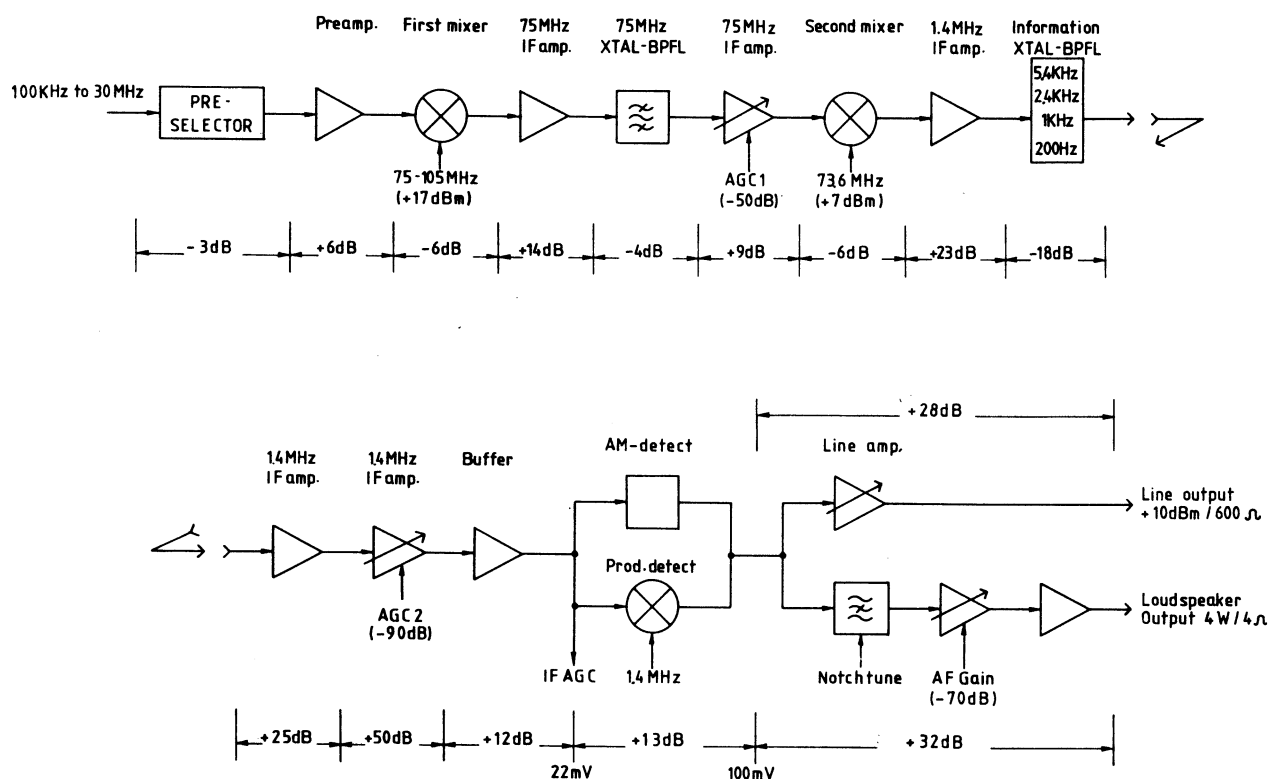


Figure 8.1 Overall Functional Block Diagram 8-5



Note: Voltage Gain shown are for reference only

Figure 8.2 Signal path block diagram

The Synthesizer Assembly A1, generates the first local oscillator signal tunable from 75 MHz to 105 MHz in 10 Hz increments.

The Standard Assembly A2, generates the second local oscillator signal at 73.6 MHz, the Synthesizer Assembly reference signal, and the synthesized beat frequency oscillator signal tunable from 1.393 MHz to 1.407 MHz in 10 Hz increments.

The Microcomputer Assembly A8, performs the overall control of the receiver. Typical tasks handled by the assembly:

- Control of the individual assemblies
- Keyboard and steptune reading
- Display refreshing
- AGC/GC through multiplexed D/A-A/D conversion
- Programmable memory set-ups
- Scanning
- Channel stepping
- Squelch control
- Remote control
- Diagnostic routines

Communication between the Microcomputer Assembly and the remaining assemblies is conducted over an internal bus running on the mother pc-board and the front panel ribbon cable.

8.13 Synthesizer Assembly A1

The functional block diagram of the Synthesizer Assembly is shown in Figure 8.3

1831 and 2563. This output is compared with the 40,96 kHz reference clock in a sample and hold phase detector. The ratio P is used as input to a digital loop adding the fractional ratio to an

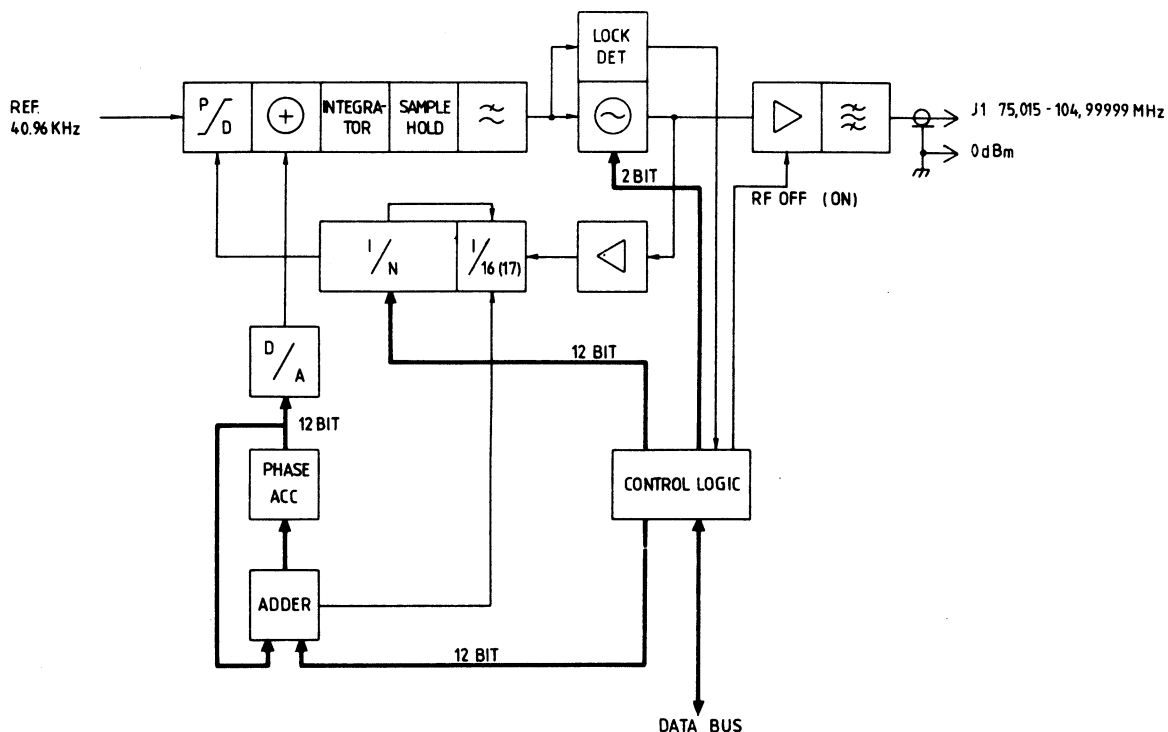


Figure 8.3 Synthesizer Assembly

The assembly generates the 75.015-104.99999 MHz 1. Lo signal for the Front-end Assembly A3. The synthesizer uses a fractional N technique, where the loop output frequency is equal to the number N.P times the reference frequency, where N and P are positive integers. The output signal from the loop oscillator is routed through a 16 (17) divider, controlled either by the N counter, or by the fractional phase accumulator. The N divider combined with the 16 (17) divider changes division ratio between

accumulated residual fraction. Every time the accumulated residual fraction overflows, the 16 (17) counter is commanded to delay the 17 to 16 count transition one reference clock periode, which corresponds to deleting one puls from the signal feeding the N divider.

To compensate for pulsed sidebands on the synthesizer output signal, the residual fraction is converted to an analog signal and added to the error signal from the phase

detector. The composed error signal is filtered before entering the control input of the voltage controlled oscillator.

8.14 Standard Assembly A2

The functional block diagram of the Standard Assembly is shown in Figure 8.4

The output signal from the temperature compensated crystal oscillator is applied to two divider chains. One generating 32kHz reference clock for the 73.6 MHz loop, and one generating 40.96 KHz reference clock for the 1.4 MHz loop and the Synthesizer Assembly.

The 73.6 MHz oscillator is formed by a voltage controlled crystal oscilla-

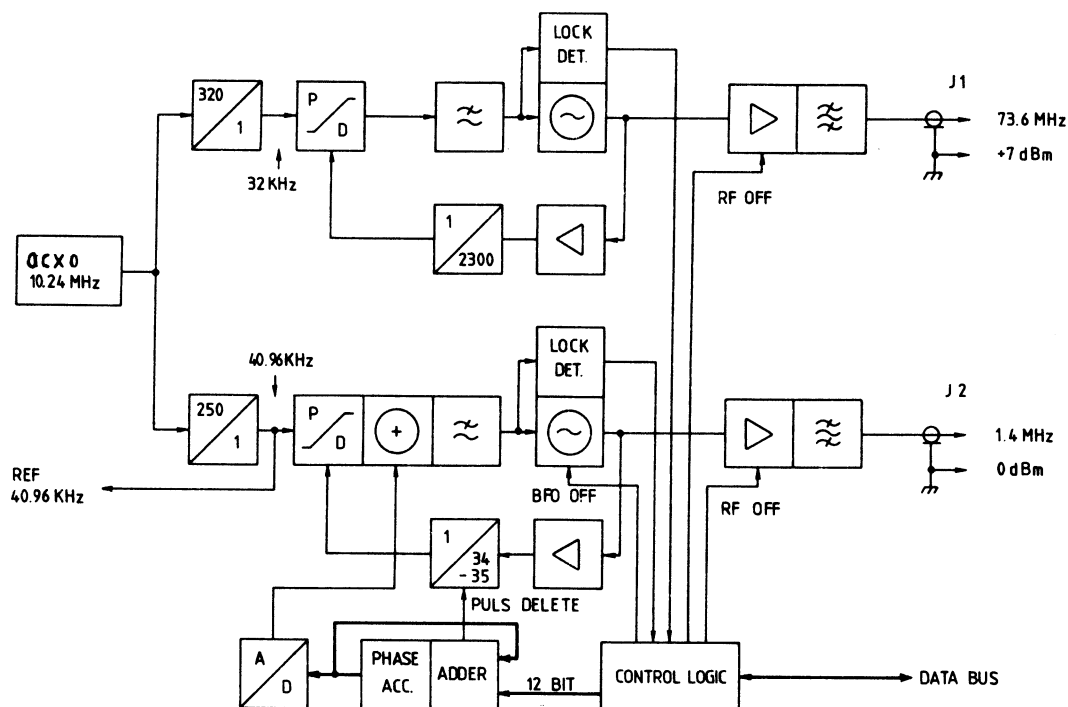


Figure 8.4 Standard Assembly

The assembly holds three basic functions:

- 10.24 MHz stable master oscillator
- 73.6 MHz synthesized second LO
- 1.4 MHz synthesized BFO

tor ensuring low side-band noise. The loop has a 10 Hz bandwidth compensating for frequency drift.

The 1.4 MHz synthesizer is tuneable in 10 Hz increments. The loop reference

frequency is 40.96 kHz and the corresponding loop band-width approx. 800 Hz

The loop uses a fractional N technique, where the loop output frequency is equal to the number of N.P. times the reference frequency, where N and P are positive integers. Due to the limited tuning requirements for the loop, the N number is fixed 34. The programmed number P is used as input to a digital loop adding the fractional ratio to an accumulated residual fraction. Every time the accumulated residual fraction overflows, the N divider is commanded to divide by 35, deleting one vco clock puls. The average vco frequency will in this way be raised with 40.96 kHz divided by P. To compensate for puls delete sidebands on the

1.4 MHz signal, the residual fraction is converted to an analog signal and added to the error signal from the phase detector. The composed error signal is filtered before entering the control input of the voltage controlled oscillator.

During AM mode reception the 1.4 MHz BFO signal is muted.

8.15 Front-end Assembly A3

The functional block diagram of the Front-end Assembly is shown in Figure 8.5

The Front-end Assembly contains the RF preamplifier, the first and second

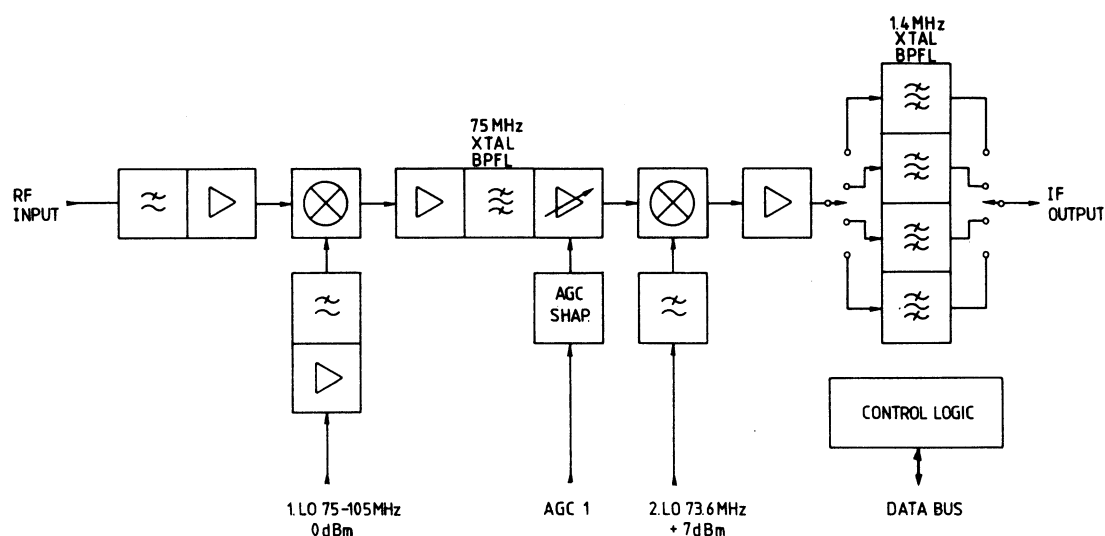


Figure 8.5 Front-end Assembly

mixer with associated injection amplifiers, the 75 MHz IF amplifier, and the information crystal filters.

The 15 kHz to 30 MHz input signal is first preamplified approx. 6 dB before entering a high LO injection (+17 dBm) up-converting mixer. The high LO signal is derived from a broad-band amplifier placed close to the mixer.

The up-converted 75 MHz first IF signal is then amplified 14 dB in a parallel FET circuit and crystal filtered to a bandwidth of approx. 12 kHz. The AGC1-amplifier following the crystal filter further amplifies the signal 9 dB with an 50 dB delayed AGC. Delayed AGC is brought in-to operation when the received input

level reaches about 40 dB above 1 microvolt.

The second mixer down converts the signal to the second IF frequency of 1.4 MHz. The down-converted signal is amplified 23 dB and impedance matched to the four information crystal filters. These filters determine the overall receiver selectivity. The filters are switched by means of serie-diodes.

8.16 Preselector Assembly A4

The functional block diagram of the Preselector Assembly is shown in Figure 8.6

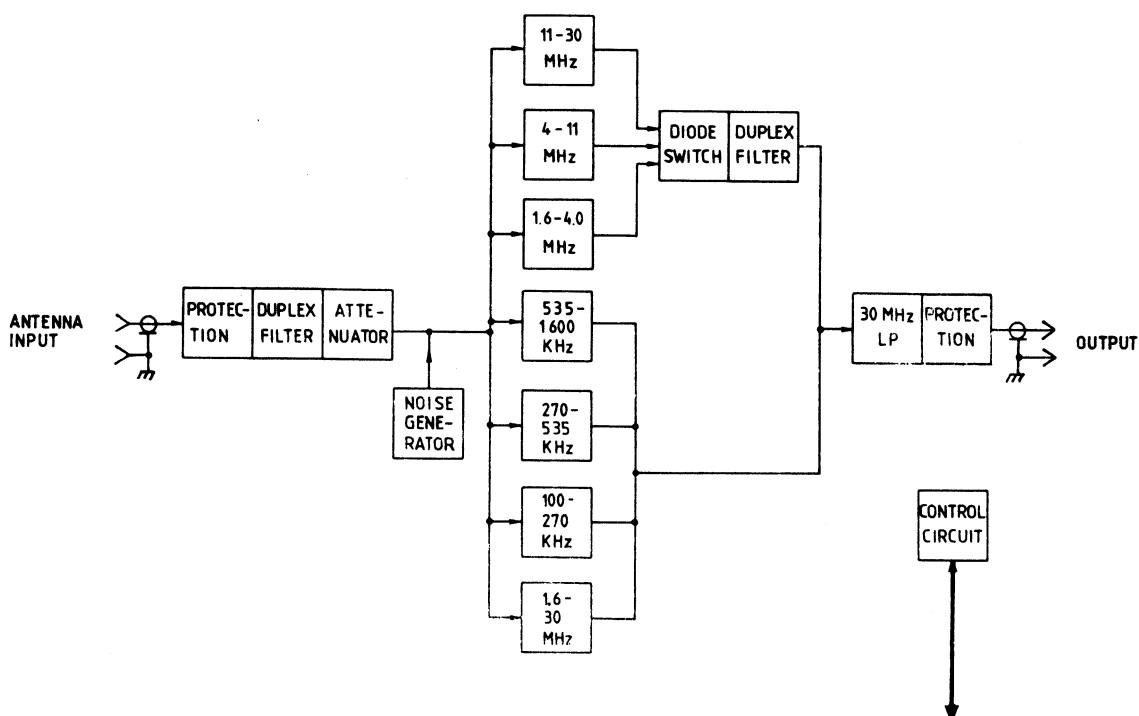


Figure 8.6 Preselector Assembly

The primary function of the Pre-selector assembly is to provide selectivity ahead of the front-end preamplifier and to match short antennas to the impedance of the amplifier.

The frequency range 15 kHz to 4 MHz is covered by four filters. Each filter consists of a tunable part to match the antenna impedance and a fixed part to attenuate out-of-band signals.

The frequency range 4 MHz to 30 MHz is covered by two tunable filters each consisting of two inductively coupled parallel resonant circuits.

The duplex filters, when supplied, attenuates signals in the TX channels of the maritime duplex bands.

A noise generator, activated by pushing the preselector knob, ensures pre-selector tuning in the absence of input signals.

To reduce interference from adjacent and/or high power transmitters, a 20 dB switchable pad is incorporated to attenuate incoming signals.

An input overload circuit protects the receiver against extreme antenna signals. The overload circuit can sustain 30 Vrms/continuous and 50Vrms/15 minutes burn-out.

An output protection circuit prevents spike products from the switch circuits to reach the Front-end Assembly.

When the receiver is operated in the scanmode the preselector filters are bypassed.

8.17 IF/AF Assembly A7

The functional block diagram of the IF/AF Assembly is shown in Figure 8.7

The IF/AF Assembly contains the 1.4 MHz second IF amplifier, demodulators, AGC detector and AF line output circuit.

The 1.4 MHz signal is first amplified approx. 25 dB and impedance matched before entering the AGC2-amplifier. The AGC2-amplifier further amplifies the signal 50 dB with an AGC-range of 90 dB. The amplified signal is separated into four paths, one for the synchronous AM-demodulator, one for the balanced SSB/CW demodulator, one for the AGC-detector, and one for the buffered IF output driving auxiliary equipment.

The AGC-detection is performed by the use of four emitter coupled limiting stages giving a true logarithmic detection characteristic. The output signal from the AGC-detector is routed to the Microcomputer Assembly for digitizing.

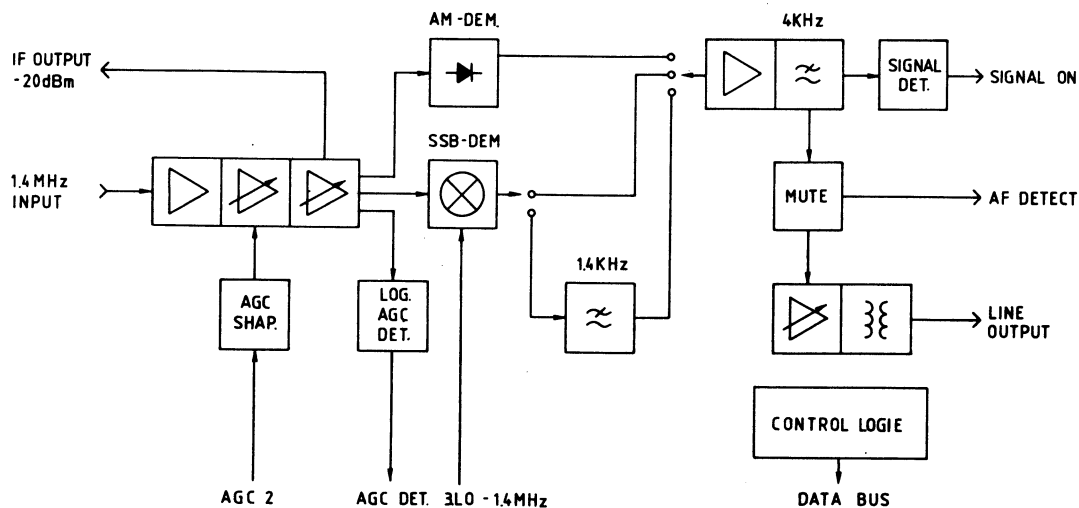


Figure 8.7 IF/AF Assembly

The output signals from the demodulators are routed through a mode switch selecting the desired reception mode. The mode switch further selects the 1.4 kHz low-pass filter used in the narr. and vnar. modes.

The output signal from the mode switch is 4 kHz low-pass filtered and applied to the mute circuit enables the Microcomputer Assembly to mute the AF signal during Simplex transmission, switch sequences and squelch operation.

Finally the AF signal is routed to the line output amplifier where the signal level is raised to a level of +10 dBm/600 Ω . The line level is adjustable from the rear panel of the assembly.

8.18 Microcomputer Assembly A8

The functional block diagram of the Microcomputer Assembly is shown in Figure 8.8

The assembly consists of an 8085 microprocessor largescale integrated circuit that controls all basic functions within the receiver.

The operating system software for the microcomputer is stored in three programmable read- only memories (PROM's). Each PROM is capable of storing 2k x 8-bit words.

Three random access memory chips (RAM's),

capable of storing $3k \times 4$ - bit words each, are required for the temporary storage and manipulation of input and output data. During power failure and receiver standby one of the RAM's are powered from a 3V battery back-up preventing interruptions from disturbing the stored data.

log loop provides a fast attack AGC2-level for the IF/AF Assembly. A digital AGC2-level is formed by an A/D-conversion (Successive approximation by D/A-conversion) of the analog AGC2-level, and controls the hold and decay parameters. The digital AGC1-level to

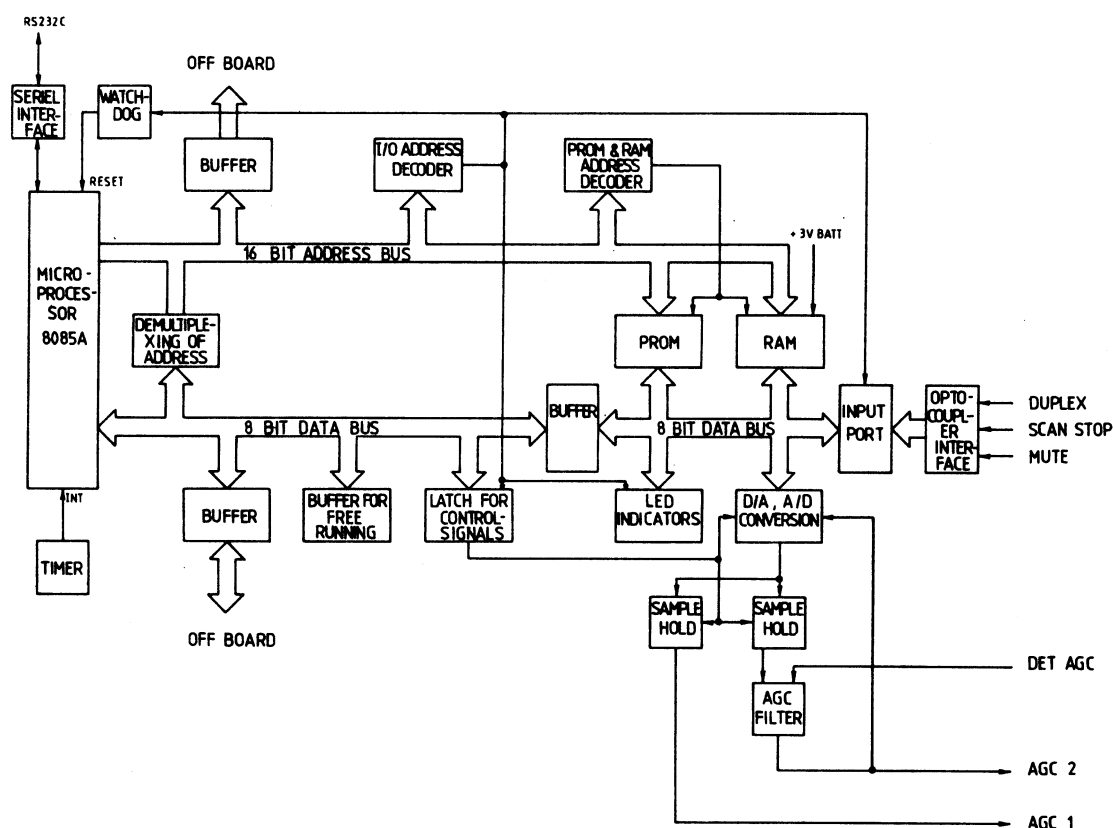


Figure 8.8 Microcomputer Assembly

Various buffers and decoders assure proper drive levels and timing to and from various circuits and input/output ports.

Timing of the assembly is via an 6.144 MHz crystal oscillator contained in the CPU chip.

The Microcomputer Assembly performs the automatic gain control. An ana-

the Front-end Assembly is derived from the digital AGC2-level.

8.19 Power Supply Assembly A10

The functional block diagram of the Power Supply Assembly is shown in Figure 8.9.

Part of the AF circuits, the notch filter and the AF power amplifier, is included in the assembly.

The AC mains is transformer-coupled to bridge rectifiers, followed by current limited voltage regulators (fold-back limited) delivering +5V, -15V and +15V.

lay, controlled by an optocoupler sensing mains drop-out. The DC to AC converter is released to operate in the same instance the relay is open.

The regulated output voltages are controlled by the front panel on/off switch. When the switch is turned off the re-

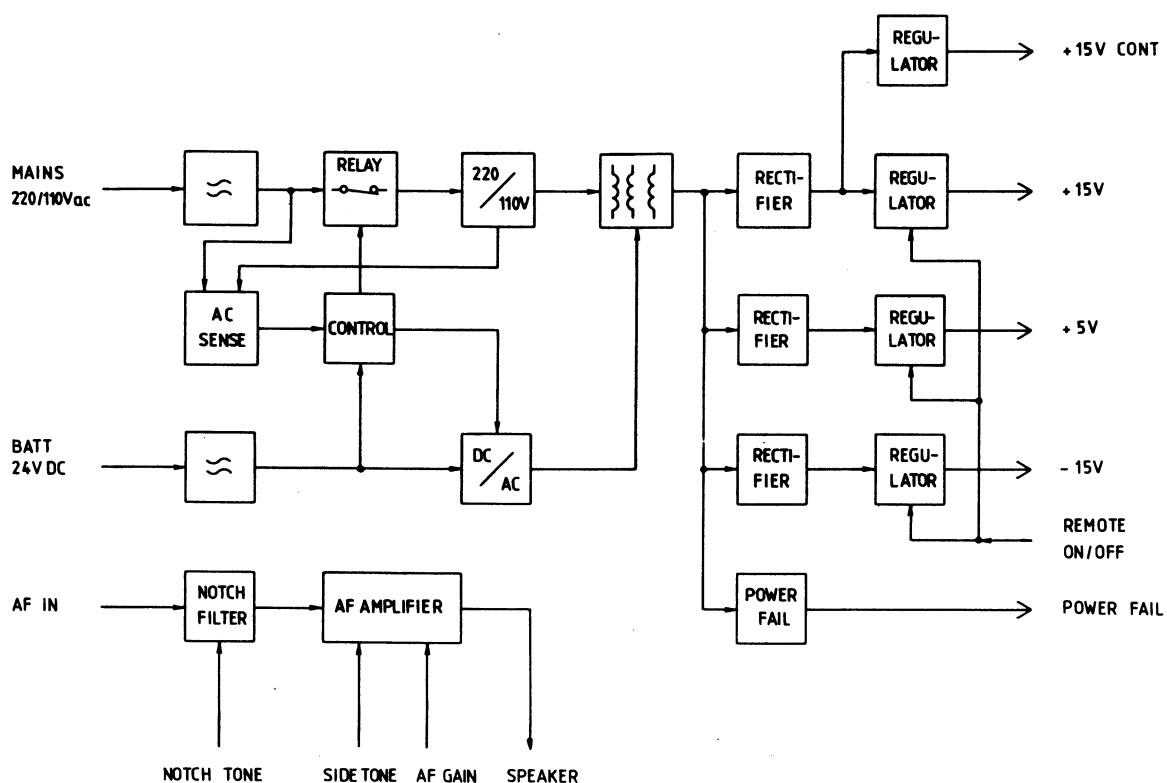


Figure 8.9 Power Supply Assembly

The power supply incorporates a floating inverter enabling the receiver to be driven by a 24Vdc source. The DC supply is converted to 80Hz ac and applied to a tertiary winding on the mains transformer.

The changeover between the mains supply and the DC supply is performed by a re-

ference voltage for the regulators is grounded, causing the output voltages to be removed, while the remaining part of the assembly will continue energized. An extra +15V regulator, servicing the optional oven-stabilized reference oscillator, is bypassed by the front panel on/off switch.

By means of an on/off switch positioned on the assembly rear panel the receiver may be deenergized. To avoid information loss during supply drop-out, a power failure circuit sensing the mains transformer secondary voltage, generates a look-ahead warning for the Microcomputer Assembly.

The AF part of the assembly contains a voltage controlled notch filter covering the range 300 Hz to 2700 Hz, a voltage controlled gain variable preamplifier and a 4W/4 ohm loudspeaker amplifier. A sidetone input, used during CW/SIMPLEX operation is mixed to the preamplifier AF signal.

8.20 Front Panel Assembly A11A1

The Front Panel Assembly mounts and interconnects most of the front panel controls, including power on-off/dimmer control, RF gain, AF gain, notch tune, mode select, bandwidth select, and receiver frequency/BFO tune. The LED's, meter read-out, and phone connector are also mounted on this assembly.

All digital controlled pushbuttons, the tuning knob information and the digi-

tized RF-gain setting are scanned by the Microcomputer Assembly. Synchronous the LED readouts and the front panel meter are updated. The assembly incorporates A/D-D/A converters for converting the analog RF-gain and meter information.

The only analog signals routed to and from the assembly are the DC-voltages controlling the notch tune and gain setting of the AF circuits, and the phone signal for the front panel mounted phone jack.

A single ribbon cable interconnects the assembly to the receiver mother board.

8.21 Mother Board A12A1

The receiver mother board ties all parts of the receiver together. It routes the front panel controls, the microcomputer controls and the stabilized voltages to the remaining assemblies.

Table 8.2a Key values during self-test

KEY DEPRESSED	VALUE DISPLAYED
SSB	11
AM	10
RTTY	12
CW	13
wide	18
inter	19
narr	1A
vnar	1B
off	20
slow	21
fast	22
att	24
scan	36
bfo	35
tune	34
C	37
comma	8A
0	80
1	81
2	82
3	83
4	84
5	85
6	86
7	87
8	88
9	89
rc1	31
sto	30
500	32
2182	33

Table 8.2b Fault Analysis Procedures

Find the symptoms below that match the fault condition and follow the hints.

SYMPTOM	POSSIBLE CAUSE
1. Receiver dead. Mains OK. Fuse not blown. No LEDs lit.	A10 Power Supply A11 Front Panel on/off switch
2. Receiver dead. Mains OK. Fuse blown and new fuse also blows.	A10 Power Supply Diodes, series-transistors, 75V zenerdiodes
3. Front Panel dead. Noise is heard in the loudspeaker during power- up. No LEDs flashing on A8 back plane.	A8 Microcomputer A10 Power Supply 5V missing
4. Front Panel dead. Some LEDs flashing on A8 backplane.	A11 Front Panel
5. Display very weak. Receiver else OK.	A11 Front Panel Dimmer Circuit A10 Power Supply 8V missing
6. Part of display lights extremely bright while the rest is not lit. Receiver stops operation.	A8 Microcomputer 8085
7. The same display segment is missing in all figures	A11 Front Panel Driver transistor Interconnection cable to motherboard
8. Display shows "FCS FAIL" and/or "FFFF.FF" steadily or periodi- cally. Pressing a key can cause an "OSC 1 Err" read-out.	A10 Power Supply VBB, VEE or VFF drifting or incorrectly adjusted
9. The display shows "An FAIL" during power-up or during keyboard operation.	Microcomputer-interface on An is faulty

Table 8.2b (continued)

SYMPTOM	POSSIBLE CAUSE
10. "OSC 1 Err" during frequency or mode changes.	A1 Synthesizer. VCO out of lock.
11. "OSC 2 Err"	A2 Standard. 73.6 MHz oscillator out of lock.
12. "OSC 3 Err"	A2 Standard. 1.4 MHz oscillator out of lock.
13. Receiving Frequency incorrect. No error read-outs.	A1 Synthesizer. Digital circuits. A2 Standard. 40.96 kHz reference.
14. Sensitivity poor.	Signal Path. Oscillator levels.
15. Sensitivity poor. Receiver runs testprogram without error read- outs.	Antenna cable. A4 Preselector. Input protection. Range switches.
16. "An FAIL" during testprogram.	Microcomputer-interface on An is faulty.
17. "OSC 1 Err" during testprogram. No errors during normal operation.	A1 Synthesizer. VCO range switch. VCO adjustment.
18. "GAin Lo" 5 times followed by "SEnS Lo" one time during testprogram.	The signal-path gain is low. A3 Front-end. A7 IF/AF. A1 Synthesizer output level. A2 Standard. 73.6 MHz level. Interconnection cables.
19. "GAin Lo" and "no Audio" 5 times followed by "SEnS Lo" one time during testprogram.	Same as 18.
20. "GAir Lo" and "no Audio" 5 times during testprogram.	A1 Synthesizer frequency wrong, digital error.

Table 8.2b (continued)

SYMPTOM	POSSIBLE CAUSE
21. "no Audio" during testprogram. The loudspeaker output is weak and distorted.	A2 Standard. 1.4 MHz level or frequency. A7 IF/AF demodulator. Interconnection cable.
22. "GAin Lo" in one of the bandwidths during testprogram.	A3 Front-end crystal filter.
23. "SEnS Lo" during testprogram. Sensitivity poor.	A4 Preselector range switches. Interconnection cable to A3. A3 Front-end input amplifier or lo amplifier.
24. "SEnS Lo" during testprogram. Receiver operates normally.	This is not necessarily a fault, but can be caused by temperature drift in the AGC-circuits.
25. "no Audio" during testprogram. Receiver operates normally.	Same as 24. + A7 IF/AF AGC detector not adjusted for -20dBm output from A7J2. Audio detector.
26. Audio distorted in AM.	A7 IF/AF demodulator. AGC detector not adjusted for -20dBm output from A7J2.
27. Audio missing or weak. No error read-outs during testprogram.	A10 Power Supply. Audio amplifier. A11 Front Panel AF potentiometer Interconnection cable to motherboard.
28. Receiver acts strange when pressing certain keys.	A8 Microcomputer 8085 or EPROMS.
29. Receiver loses user-programmed channels.	A8 Microcomputer Battery run out. CMOS RAM faulty.
30. "FCS FAIL" during power-up.	A8 Microcomputer RAM circuits faulty.

A8 MICROCOMPUTER MODULE, LED INDICATION

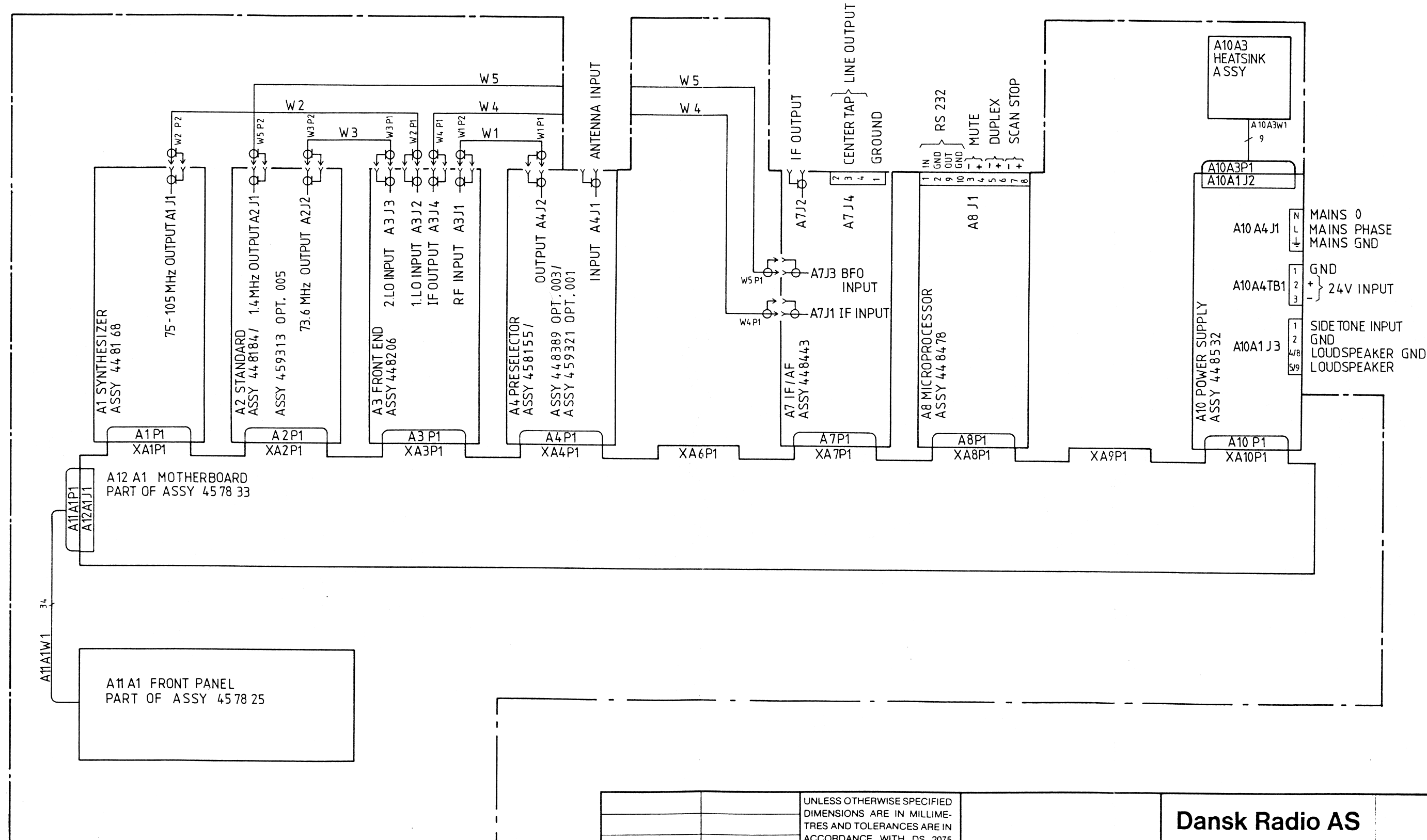
The four LEDs on the rear panel of the A8 module are primarily intended for use at the factory test of the module.


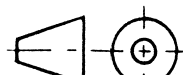
When the A8 module is mounted in a receiver, the LEDs will act as follows:

1	0	off	}	When power is turned on. Duration $< \frac{1}{2}$ sec.
2	●	on		
3	0	off		
4	0	off		
1	●	on	}	After power has been turned on, until the muting is released and the receiver goes into normal operation. Duration approx. 2 sec.
2	0	off		
3	0	off		
4	●	on		
1	●	flashing	}	In normal operation. Flashing period 1 sec.
2	0	off		
3	0	off		
4	●	flashing		
1	●	flashing	}	When in test program. Flashing period 1 sec.
2	0	off		
3	●	flashing		
4	●	flashing		

The LEDs are not for fault finding during after sales service.

D
C
B
A



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIME- TRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075			Dansk Radio AS			
			DR.	VH 14.10 1987	TITLE INTERCONNECTION DIAGRAM M3000			
			CH.					
			AP.					
			AP.					
		ANGLES						
		LIN. DIM.						
	M3000	MATERIAL	<div>FIRST ANGLE PROJECTION</div> 		SIZE	CODE IDENT	DRAWING NO.	
NEXT ASSY	USED ON				A 2		46 54 29	
APPLICATION					SCALE		SHEET 1 OF 1	

ASSY 448168, SYNTHESIZER ASSEMBLY

Service Sheet A1

1. Phase Detector

The J-k flip-flop forms a set-reset phase detector, switching the differential transistor pair Q_1 and Q_2 . U31 is clocked by the reference signal, 40.96kHz negative going impulses, turning the diode switch CR4 "ON". CR4 is connected to a constant current generator, making the ramp generator ramp up. U31 is preset by the frequency divided signal from the VCO, terminating the ramp up period.

2. Ramp Down Switch

The ramp down period is controlled by the diode switch and has the length of 832 VCO-cycles. The voltage at TP2 is 2.0V in the ramp down period and -1.2V in the remaining.

3. Ramp Generator

The ramp generator is an inverting current integrator built with discrete components ensuring fast response and low noise.

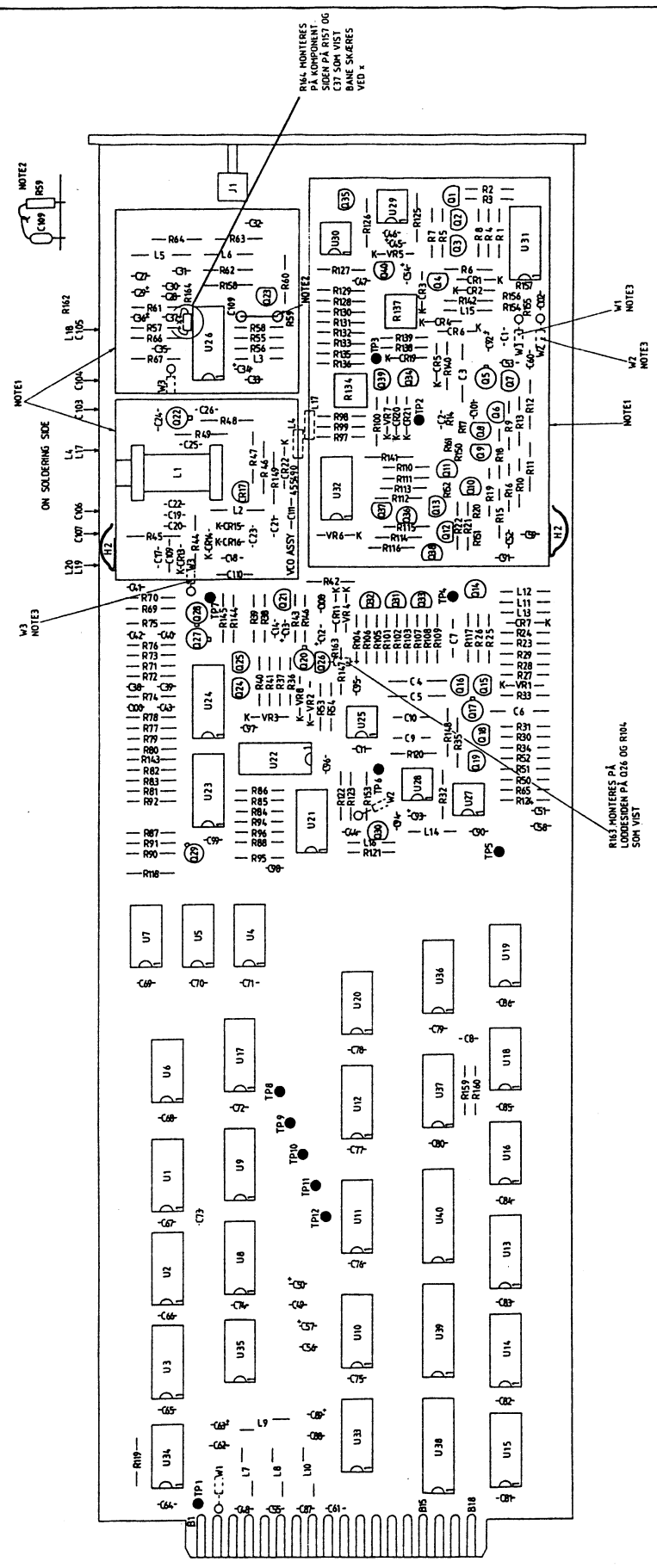
4. Summing Amplifier

The current from the constant current generator U29, Q35 is added to the current from the resistance network R128-R139 by the summing Amplifier U30, Q40. The current from R128-R139 is controlled by the diode switches CR19-CR21.

5. Supply Filtering

REVISIONS		DATE	APPROVAL
ZONE/TRA	DESCRIPTION		
H	40P547	11/21	VH/GUS

NOTE1: max Komponenthøjde: 12,5mm
 NOTE2: R59 - C49 monteres på komponent side.
 NOTE 3: KORT AFISOLERING



Dansk Radio AS		TITLE
FREQUENCY GENERATOR SYNTHESIZER		801126
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED	DR 801126	CH
ANGLES	AP	AP
LIN DIM	AP	AP
MATERIAL	AP	AP
APPLICATION	AP	AP
457841	M3000	USED ON
NEXT ASSY	USED ON	
FIRST ANGLE PROJECTION		
SIZE	CODE DENT	DRAWING NO
A1	A1	446168
SHEET 1 OF 1		

6. Sample and Hold

The transistor pair Q_{15} , Q_{16} generates the gate voltage to the first sample switch Q_{14} . The voltage at C_4 is transferred to the sample capacitor C_5 by the second switch Q_{17} . The signal at TP5 is positive going impulses with a frequency of 40.96kHz. At the output of the unity gain amplifier U28, the voltage is between -9V and +10V.

7. Loop Filter

Active second order lowpass filter $f_{cut}=3\text{kHz}$ approx.

8. VCO-Supply

The voltage at TP7: -7.5V.

9. Voltage Controlled Oscillator

The 75MHz - 105MHz VCO is controlled by a voltage between -9V and +10V. R149 and CR22 is inserted for linearization of the voltage-frequency function. The frequency range is divided into 4 subranges by switching the fixed capacitors C_{19} and C_{20} .

The VCO control voltage, TP6, may be adjusted by the coil L1. With the exciter tuned to 29.99 MHz, the voltage shall be +10.0V at $t_{amb.}=25^{\circ}\text{C}$.

10. Range Shift

The range shift shall be in accordance with the following table:

Frequency kHz	Voltage at C15	Voltage at C16
15-5999.99	-8.2V	-8.2V
6000-11999.99	+15V	-8.2V
12000-19999.99	-8.2V	+15V
20000-29999.99	+15V	+15V

11. Lock Detector

The output of the lock detector is high when the VCO control voltage is between -9.5V and 11.5V. Outside this range the output is turned low.

12. Output Buffer

The necessary amplification and isolation are provided by the output Buffer U26. Undesired spurious and harmonic outputs are attenuated by the band-pass filter L_5 , L_6 and the attenuator R_{62} - R_{64} insures a low VSWR. The output is attenuated approx. 60dB by activating Q_{26} .

13. Isolation Amplifier

The signal from the output buffer is fed through the cascode configuration Q_{27} and Q_{28} to protect the VCO from noise generated by the prescaler.

14. Prescaler

The prescaler has a divide ratio of $N=17$ depending on the logical level of U16 pin 10. ECL to TTL conversion is provided by Q_{29} . Noise from the prescaler is isolated from the phase detector by the inverter Q_{30} .

15. Synchronizer

The synchronizer generates the timing signals for the sample and hold, ramp down, D/A conversion and pulse removal. One cycle of the Synchronizer is similar to one reference cycle. (24.4μsec). One reference cycle contains 1831-2563 VCO cycles, depending on the tune frequency. The reference cycle is defined at the negative transition of U21 pin 5. When 1536 VCO-cycles remain in the reference cycle, U18A is clocked and the sample and hold circuit is activated. When 1280 VCO-cycles remain, the decode counter U17 starts counting, defining the time for the ramp down period. The D/A conversion for the phase compensation is started when 1216 VCO-cycles remain (U19 pin 9). In case of an overflow from the adder U12 the pulse removal will take place when 192 VCO-cycles remain. The pulse remove signal is present at U20 pin 9.

16. Pulse Swallowing Counter

The counter is built by 3 4-bit counters and 1 flipflop. When the down counter U15 reaches 0000, U15 is reset by U18B and the counter ratio for the prescaler is changed from 17 to 16. The counter ratio N is loaded into the counters in binary code. The binary code is split into a 4-bit code A and a 8-bit code P . Thus the wanted ratio is

$$N = P \times 16 + A$$

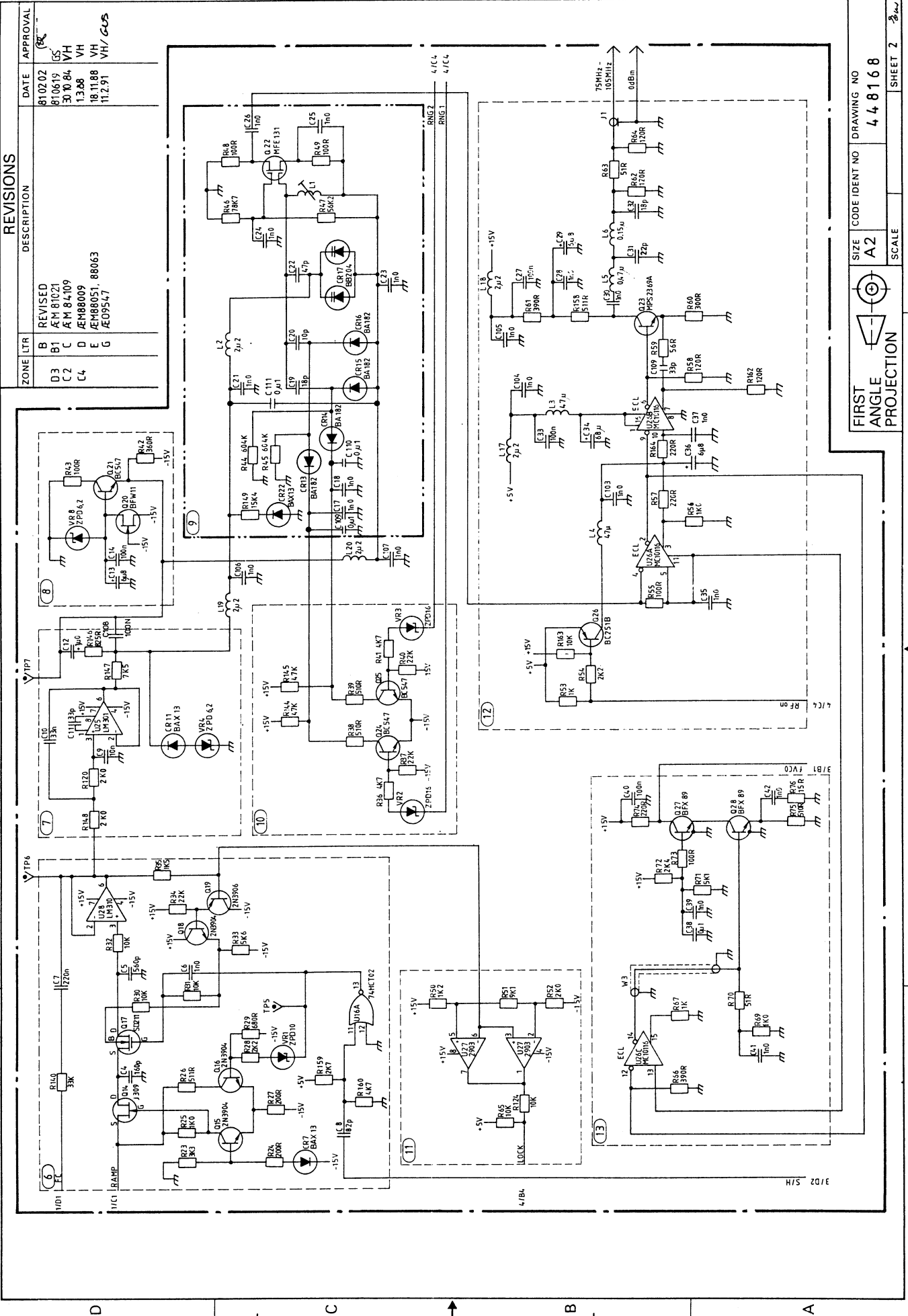
At the start of the reference cycle all counters are loaded. The first $A \times 17$ VCO-cycles the prescaler ratio is 17. U15 is reset and U14, U13 go on counting the remaining $(P-A) \times 16$ VCO-impuls. The result is

$$A \times 17 + (P-A) \times 16 = P \times 16 + A = N$$

When all counters reach the zero state, U13 pin 13 goes low. After 1 prescaler cycle = 16 x VCO cycles, U21 pin 5 goes low, loading all 3 counters. After 2 prescaler cycles, the load signal is inhibited and the count down period starts. As loading takes 32 VCO cycles, the counter must be programmed to the desired ratio minus 32.

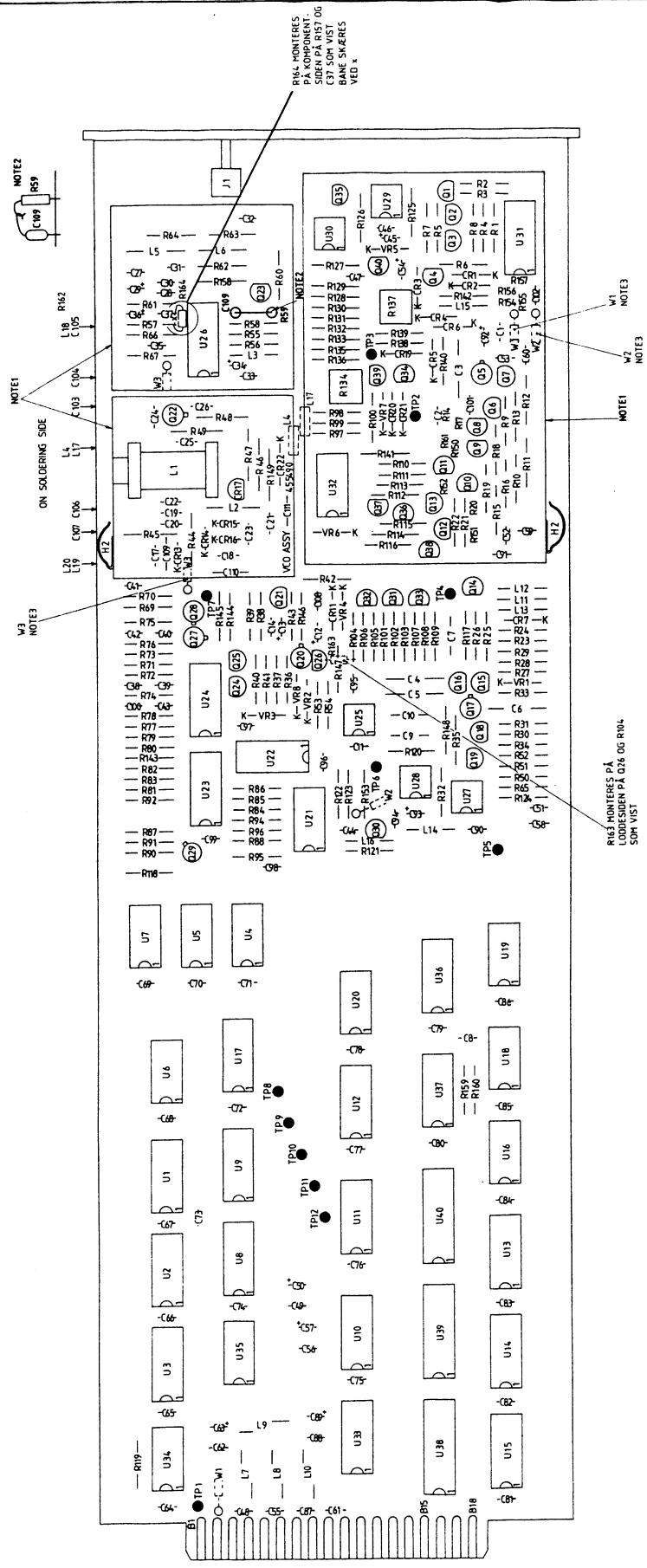
17. Rate Counters

For each reference cycle, the content of the latches U8, U9 is loaded into the linear counters U1-U3. In the ramp down period, U1-U3 are counted down with a frequency $f_{vco}/64$. When they reach the zero state, they are reset by an external flip-flop. Each counter corresponds to 4-bit of the latches U8, U9 and the period of time in which the counters are active is proportional to the 4-bit content of the latch. While the counters are active, the switches Q_{31} - Q_{33} are switched "ON".



REVISIONS		DATE	APPROVAL
ZONE	TR	DESCRIPTION	
1	H	40954.7	VH/GUS

NOTE1: max Komponenthøjde 12,5mm
 NOTE2: R59 - C109 monteres på komponentside.
 NOTE 3: KORT AFISOLERING



Dansk Radio AS		TITLE	
FREQUENCY GENERATOR SYNTHESIZER		R011.26	
DR. 01	CH	AP	AP
457841	M3000	457841	M3000
NEXT ASSY	USED ON	457841	M3000
APPLICATION		FIRST ANGLE PROJECTION	
SIZE A1		CODE IDENT DRAWING NO 448168	
SCALE 2:1		SHEET 1 OF 1	

18. Current Generators

3 current sources are used for the D/A conversion and the ramp up. The FET Q_{39} is inserted to insure a high output impedance.

19. Adder/Accumulator

For each reference cycle, the latches U8 and U9 are clocked and the fraction part, present at the input of the adders U10-U12, is added to the content of the two latches. When the adders overflow, the synchronizer is activated and one pulse is removed in the counting sequence.

20. Current Switches

The current switches Q_{31} - Q_{33} are operated from the Rate Counter, U4, U5 and U7.

The current switched by Q_{33} is also used as ramp up current for the ramp generator.

Consequently the ramp up current and the current for the D/A conversion of the most significant 4-bit is the same current.

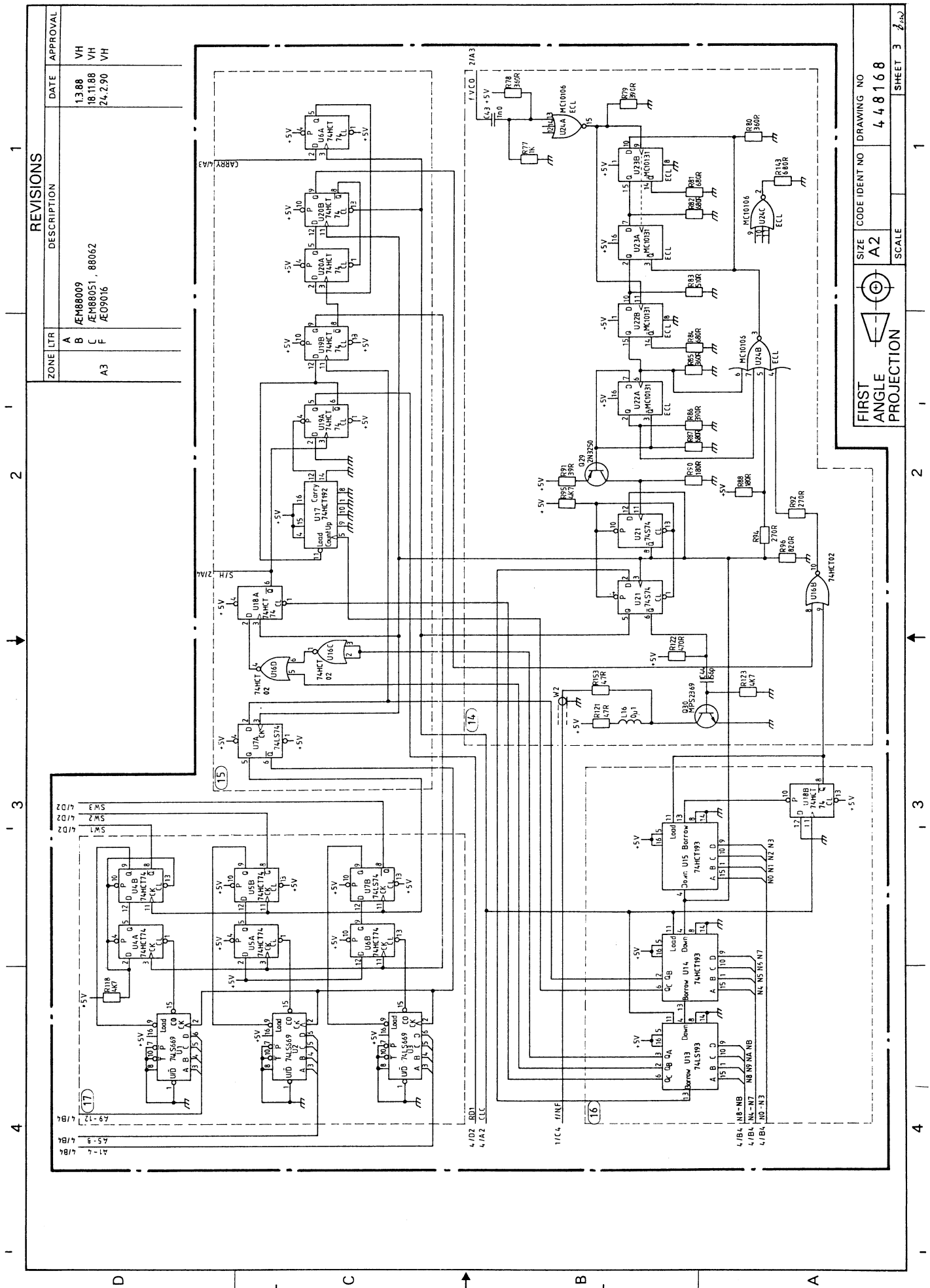
Q_{36} - Q_{38} generates the switch voltages for the ramp up D/A switch Q_{34} .

21. Interface

The data selector U33 selects the desired input or output latch.

The 24-bit frequency information is available at the output at U38-U40.

The input latch U36 sets the frequency range and the \overline{RF} ON. At the output latch U37 the "out of lock" signal is checked, and the overflow indication from the adders U10-U12 is available at U37 pin 4.



ASSY 448184, STANDARD ASSEMBLY

Service Sheet A2

1. Phase-Frequency Detector

U23 generates a matched set of currents. One for the current translator U19, Q8, twice this current to Q9, and a reference current to the D/A converter U22. The current from Q8 acts as a ramp up current for C29. R60, R61 and R62 limiting this function. The ramp down current from Q9 is controlled by the switches CR5 and CR6. The ramp down time is dependent on the count down VCO signal. This is performed by a set-reset function, U18a and Q7. The wave form in TP10 is an approx. triangle. This is fed to the loop integrator U20, C31, C32 and R65 by R62. The loop bandwidth is approx. 800Hz. The diodes CR7 and VR3 reduce saturation time in the loop. To reduce 40.96kHz sidebands a second order low pass filter with a cut-off frequency at 2.5kHz is added U21, R66, R67, C33 and C34.

2. 1.4MHz VCO

Q11 and Q12 perform as an oscillator with tuned circuit, L17, L18, C39 and C40 in the collector of Q11. The feedback path is formed between the emitters of Q11 and Q12. A buffered output is taken from Q12 via a low Q tuned circuit L22, C42 and C43. The voltage controlled capacitor diodes CR8 and CR9 allow a tuning range at approx. 6.8kHz/V. The nominal DC voltage in TR11 is +3V at 1.400MHz adjusted by L18 at 25°C room temperature.

3. Output Amplifier

0dBm/50Ω output is performed by Q13 with the tuned circuit L19, C48 and L20. R87, R88 and R89 is a 3dB attenuator which gives a more exact 50Ω output impedance.

The output level is adjusted to 0dBm \pm 0.5dB by means of R111. Q14 allows RF ON/OFF switching, with approx. 50dB attenuation.

4. Buffer-Translator

Q15 and Q16 is an emitter coupled amplifier which gives excellent isolation between the counter and the VCO. The output level is a 0-5V square wave.

5. Lock Detector

The control voltage to the VCO is fed to a window detector U17a-b. The loop is within proper conditions if the voltage at TP11 is between 0V and +6V. Under this condition Q17 gives a HIGH, TP14.

6. API Generator

The D/A converter (U22), forms a part of the API system (analogue phase interpolator). It converts an 8-bit phase information from the adder in 8 to a ramp current. This current is converted to a voltage by R61, and injected to the loop by R60. It is adjusted to eliminate the stepped ramp error signal arising from the fractional system.

7. Loop Divider

This divider works in two modes. Divided by 34 or 35. When the fractional part is zero (input to U32, U33 and U35 equals 0), the counter is continuously divided by 34. The output frequency is then $34 \times 40.96\text{kHz} = 1392.64\text{kHz}$. In general the average output frequency is set by:

$$F_o = (34 + F/4096) \times 40.96\text{kHz}$$

where $F = 0-4095$ (fractional part).

If $F = 1$, 4096 reference pulses will elapse before the counter receives one divided by 35 instruction. This means that the phase detector will receive an instruction for raising the frequency each $4096 \times (1/40.96\text{kHz}) = 0.1\text{sec}$. The average frequency will raise 10Hz. For $F=2$: 20Hz and so on. For $F_o=14000.00\text{kHz}$, $F=736$.

8. Adder and Phase Accumulator

The fractional part consists of 3 cascade coupled 4 bit adders connected with 3 x 4 bit latches. On reference clock, the data present on the data inputs of the latches will be transferred to the Q outputs. An addition will occur between these outputs and the data present on the frequency set inputs. After $4096/F$ additions U35 will give an overflow which is used to change the counter to divide by 35 (the same as removing 1 VCO clock cycle). The contents of the data latch U30, U31 and U34 gives a phase information that converted in 6 will show a stepped ramp function similar to the error in the loop when the API is disconnected.

9. Microcomputer Interface

U28 and U29 converts the 8 bit data bus to 14 bit data information. 11 bit for BFO frequency set, 1 for BFO RF ON/OFF, and 1 for 73.6MHz RF ON/OFF switching. U27 reads BFO lock, 73.6MHz lock, 10.24MHz level and fractional control, and transmits them to the microprocessor. U24-U26 is an address key system.

10. Divider

U1-U3 divides the input frequency of 3.68MHz with 115 to 32kHz (31.25nsec) TP1. This signal feeds the phase/frequency detector. The signal in TP1 is a negative pulse with a width of approx. 270nsec.

11. Phase/Frequency Detector

U3 performs a SET-RESET phase/frequency detector. It compares the 32 kHz from U1 -3 (TP1) with a reference signal from U9b, TP3. The output TP2 is a duty cycle controlled square wave with a frequency of 32 kHz.

12. Fine regulator

The +15V is stabilized to a +11V low noise reference for the 73.6MHz VCX0 and the 1.4MHz VCO.

13. 73.6MHz VCX0

The X-tal Y1 operates in series resonance mode with the voltage controlled circuit CR1 and L2. It forms the feedback path in the oscillator performed by Q1 and the low Q tuned circuit L1, C8 and C9. L3 eliminates the parallel capacitance in Y1. U10c ECL amplifier operates as buffer amplifier. The tune voltage at TR5 is nominally adjusted to +2.5V by L1, at 25°C room temperature.

14. Output Amplifier

The 73.6MHz +7dBm output is performed by 1/3 ECL amplifier U10c and Q3 with the tuned circuit L2, L19 and L7. R31-R33 is at 3dB attenuator which gives a more exact 50Ω output. An RF ON/Off switch function is performed by U16 and Q2. The output is disabled by approx. 60dB.

15. ECL to TTL Translator

U10b forms an isolation and driver amplifier for Q4 and Q5 emitter coupled amplifier. L8, L9 and R38 is a peaking circuit.

16. Prescaler

U11 divides by 4. The output is 18.4MHz, TP6.

17. Divider

U12 divides the 18.4MHz by 5. The output is 3.68MHz, TP7.

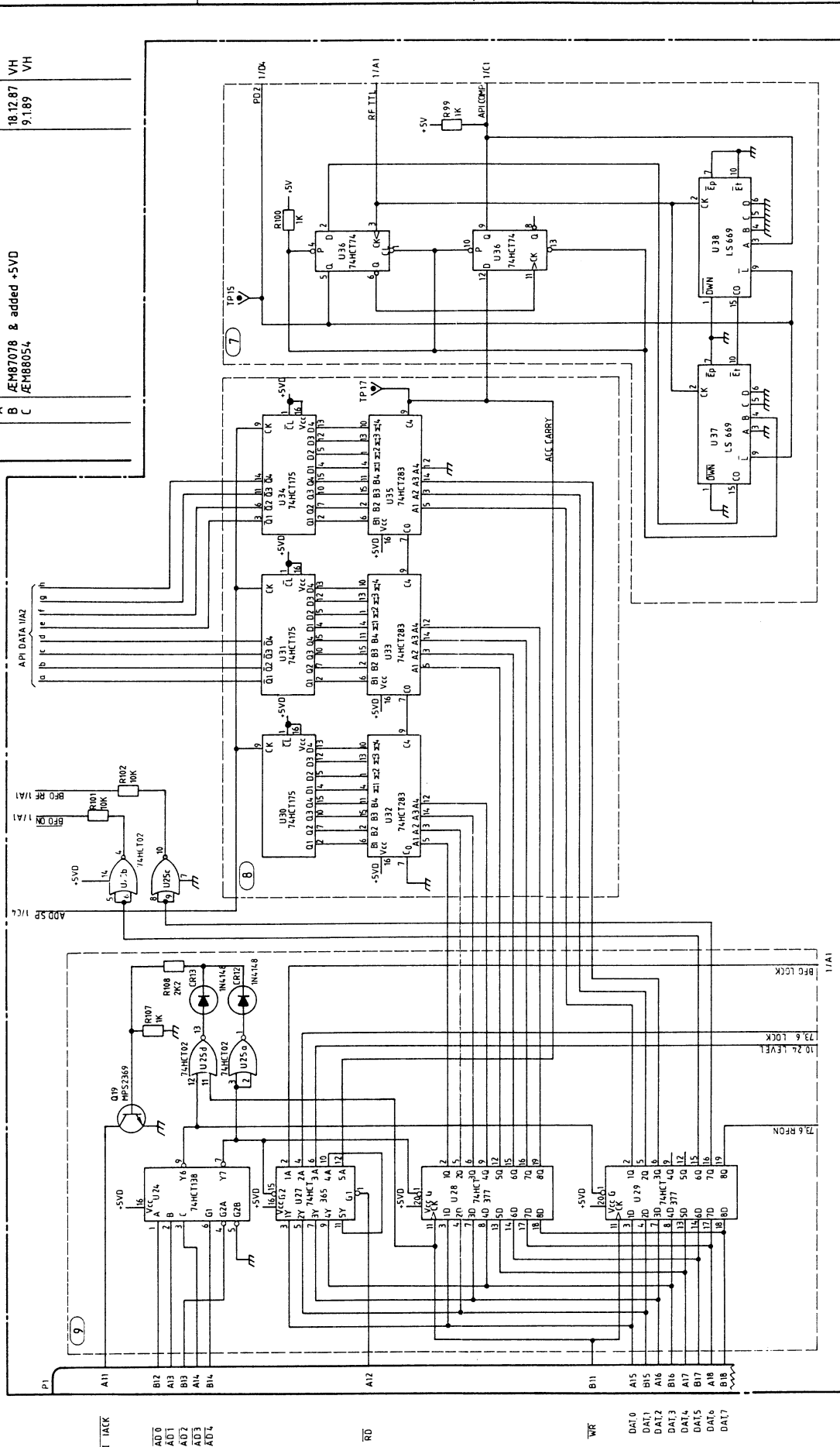
18. Loop Filter

The square-wave from the phase detector is integrated by R8 and C2. U6 is an amplifier-filter removing the 32kHz from the control voltage to the VCX0. The loop bandwidth is approx. 10Hz.

19. Divider

U7-U9 divides the input frequency on 5.12MHz (TP8) with 160. The output TP3 is a negative pulse with a width of 150nsec. The signal is used as input to the phase detector.

FIRST ANGLE PROJECTION	SIZE A2	CLASS: A2	NO.: 44 8184	SHEET 2	KK



ZONE	LTR	DESCRIPTION	DATE	APPROVAL
A		AEH87078 & added +5V	18.12.87	VH
B			9.1.89	VH
C				

20. Reference Divider

The buffered main reference oscillator signal on 10.24MHz is fed to a divide by 2 (U15a), a divide by 250 performed by U9d, U13, U14, 15b and a detector Q18, that indicates the presence of the 10.24MHz. The output from U15b is used as a 40.96kHz reference signal. The buffered signal from U16d is a negative pulse with a width of approx. 100nsec.

21. Loop Detector

The control voltage to the 73.6MHz VCXO is fed to a window detector 1/2 U17. The loop is within proper conditions when this voltage is $-10V < V < +9V$. Under this condition Q6 gives a HIGH, TP9.

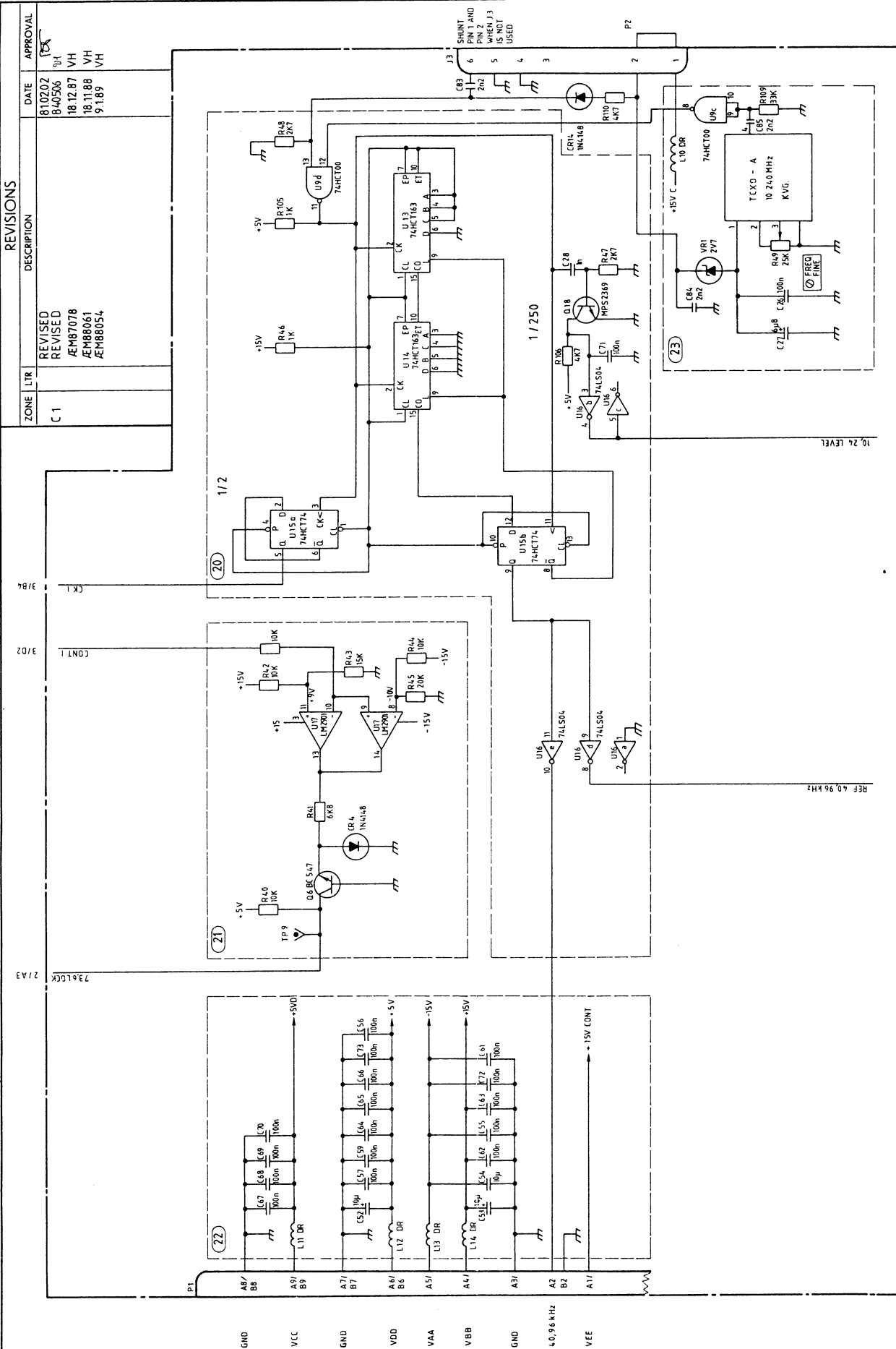
22. Filter

Power supply filter system.

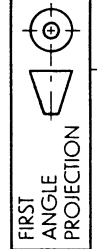
23. TCXO

Master reference temperature compensated oscillator on 10.240MHz. Frequency fine tuning adjustment can be made with R49. Connector J3 can be used to shut off the power supply to the master reference oscillator and to insert a 10.24 MHz signal from another reference source. When this option is not used pin 1 and 2 have to be shorted.

7



NO.:	448184
CLASS:	A2
SIZE:	A2
SCALE:	1
SHEET:	4
KK	



ASSY 448206, FRONT-END ASSEMBLY

Service Sheet A3

① RF Preamplifier. Gain = +6 dB

② First Mixer. Gain = -6 dB

③ 1.LO Amplifier. Gain = +17 dB

4 75 MHz IF Amplifier.

Voltage gain = +14dB. J5 is only used for factory adjustments.

5 75 MHz X-tal filter. Gain = -4dB

6 75 MHz Voltage controlled IF Amplifier.

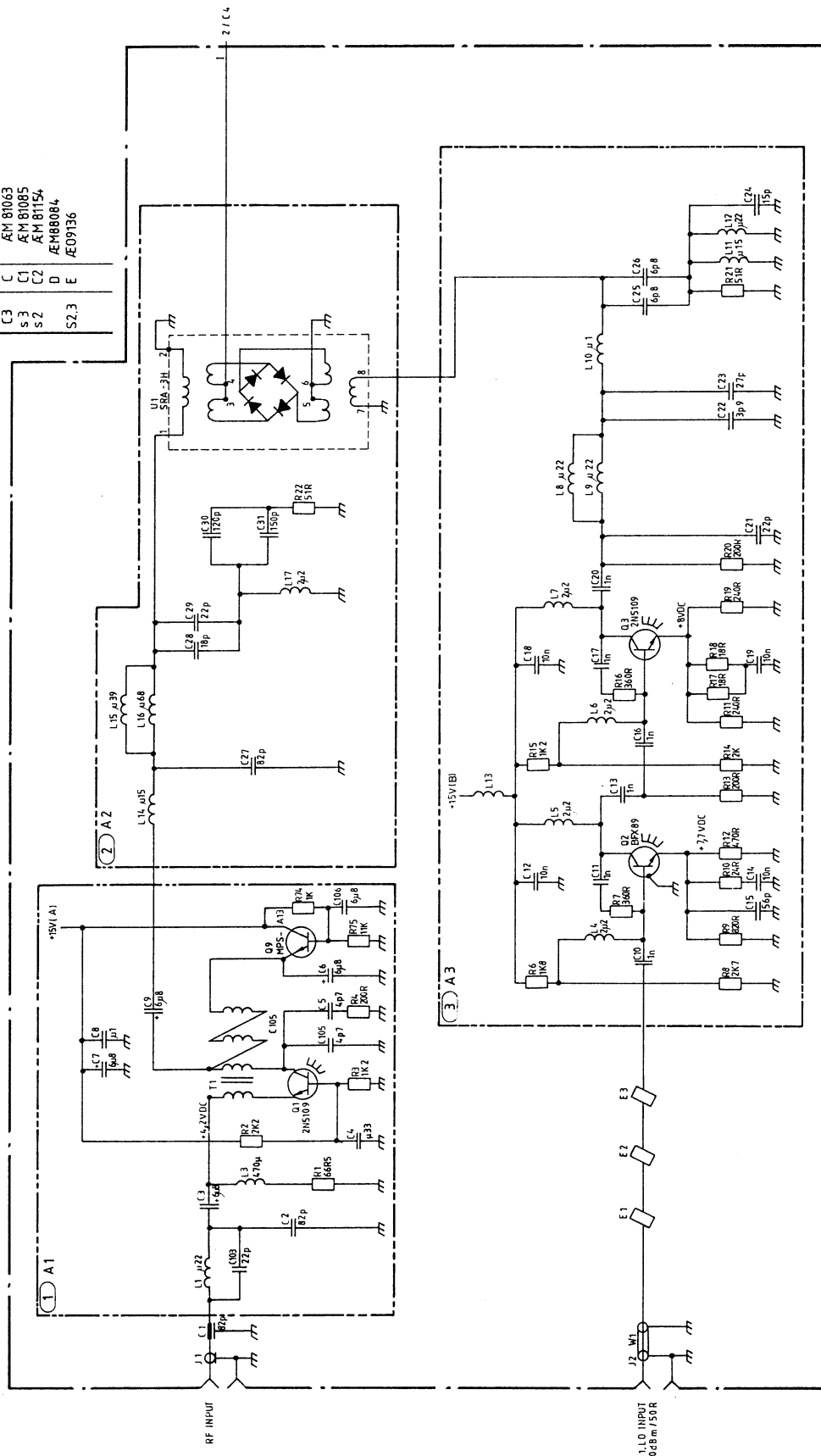
Voltage gain: -41dB to +9dB
approx. controlled by the dc-voltage applied to Gate 2 of Q7 and the current of CR13. C56 to C58 together with L41 form a 72.2 MHz rejection filter.

U2 with surrounding components form an AGC shaping circuit for the AGC voltage AGC1. Offset adjustment (R43): With AGC voltage AGC1 equal to 9V, the gain reduction of the IF amplifier is adjusted to 50dB by means of R43 (T-amb. = +25°C). The voltage range of AGC voltage AGC1 is between 0V and +10V.

7 Feed-through Filter.

ZONE	LTR	DESCRIPTION	DATE	APPROVAL
A	B	REVISED	810202	20
C3	C	ÆM 8063	81052655	
S3	C1	ÆM 8085	810819	GS
S2	C2	ÆM 81154	820208	GS
D	D	ÆM 8084	121288	VH
S2.3	E	Æ09136	18.6.90	VH

REVISIONS



Dansk Radio AS		TITLE	
FRONT - END		80 09 12	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES IN ACCORDANCE WITH DS 2075		DR: 8003	
ANGLES:		CH: 1/2	
LIN. DIM.:		AP: 1/2	
MATERIAL:		AP: 1/2	
45 78 41		M 3000	
NEXT ASSY		USED ON	
APPLICATION			
FIRST ANGLE PROJECTION		SCALE: 1 OF 4	
SIZE: A2		NO.: 448206	
CLASS: A2		SHEET 1 OF 4	

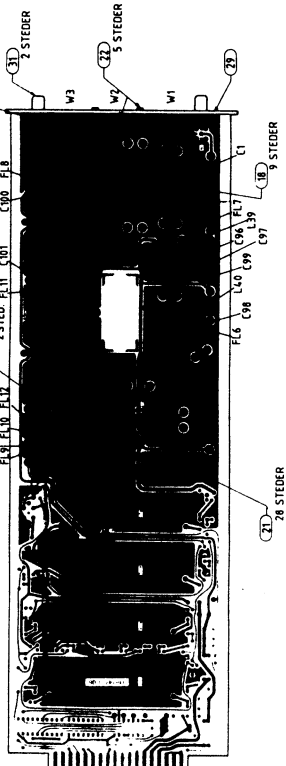
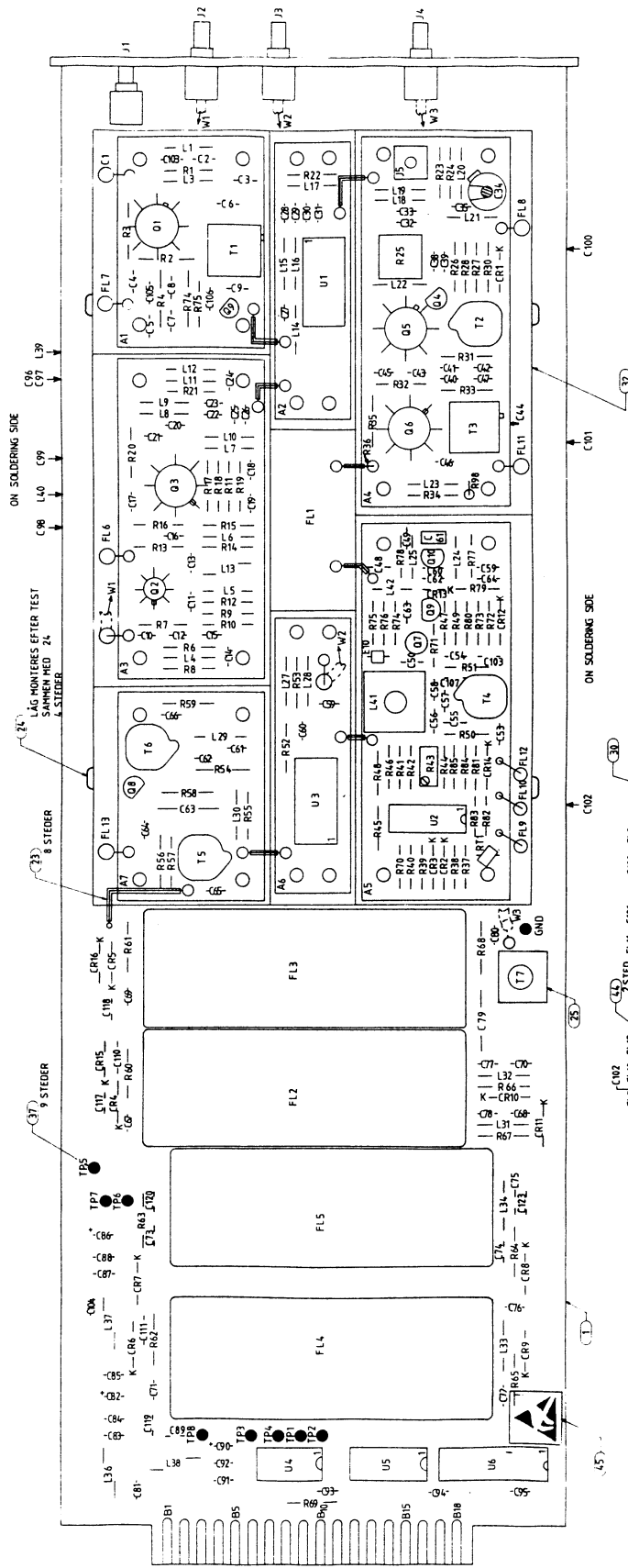


1. DO NOT REPAIR OR REPLACE (R) SUBJECT TO DAMAGE BY STATIC ELECTRICITY

NOTE
E1-E3 MOUNTED ON W1
E4-E6 MOUNTED ON W2
E7-E9 MOUNTED ON W3

REVISIONS

ZONE	DATE	DESCRIPTION	APPROVAL
1	23.08.87	INITIAL	WH
2	24.08.87	INITIAL	WH
3	24.08.87	INITIAL	WH
4	24.08.87	INITIAL	WH
5	24.08.87	INITIAL	WH
6	24.08.87	INITIAL	WH
7	24.08.87	INITIAL	WH
8	24.08.87	INITIAL	WH
9	24.08.87	INITIAL	WH
10	24.08.87	INITIAL	WH
11	24.08.87	INITIAL	WH
12	24.08.87	INITIAL	WH
13	24.08.87	INITIAL	WH
14	24.08.87	INITIAL	WH
15	24.08.87	INITIAL	WH
16	24.08.87	INITIAL	WH
17	24.08.87	INITIAL	WH
18	24.08.87	INITIAL	WH
19	24.08.87	INITIAL	WH
20	24.08.87	INITIAL	WH
21	24.08.87	INITIAL	WH
22	24.08.87	INITIAL	WH
23	24.08.87	INITIAL	WH
24	24.08.87	INITIAL	WH
25	24.08.87	INITIAL	WH
26	24.08.87	INITIAL	WH
27	24.08.87	INITIAL	WH
28	24.08.87	INITIAL	WH
29	24.08.87	INITIAL	WH
30	24.08.87	INITIAL	WH
31	24.08.87	INITIAL	WH
32	24.08.87	INITIAL	WH
33	24.08.87	INITIAL	WH
34	24.08.87	INITIAL	WH
35	24.08.87	INITIAL	WH
36	24.08.87	INITIAL	WH
37	24.08.87	INITIAL	WH
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67	24.08.87	INITIAL	WH
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70	24.08.87	INITIAL	WH
71	24.08.87	INITIAL	WH
72	24.08.87	INITIAL	WH
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79	24.08.87	INITIAL	WH
80	24.08.87	INITIAL	WH
81	24.08.87	INITIAL	WH
82	24.08.87	INITIAL	WH
83	24.08.87	INITIAL	WH
84	24.08.87	INITIAL	WH
85	24.08.87	INITIAL	WH
86	24.08.87	INITIAL	WH
87	24.08.87	INITIAL	WH
88	24.08.87	INITIAL	WH
89	24.08.87	INITIAL	WH
90	24.08.87	INITIAL	WH
91	24.08.87	INITIAL	WH
92	24.08.87	INITIAL	WH
93	24.08.87	INITIAL	WH
94	24.08.87	INITIAL	WH
95	24.08.87	INITIAL	WH
96	24.08.87	INITIAL	WH
97	24.08.87	INITIAL	WH
98	24.08.87	INITIAL	WH
99	24.08.87	INITIAL	WH
100	24.08.87	INITIAL	WH



Dansk Radio AS		dta	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS AND DECIMALS THEREOF ARE IN INCHES. DIMENSIONS ARE TO BE TAKEN ACCORDANCE WITH DS 205		TITLE	
DR B D		80 10 02	
CH		FRONT - END	
AP		SIZE	
AP		CODE IDENT	
FIRST ANGLE PROJECTION		DRAWING NO	
NEXT ASSY		4 482 06	
APPLICATION		SCALE	
USED ON		SHEET 1 OF 1	

⑧ Second Mixer.

Translate the 75 MHz IF-signal to
1.4 MHz by mixing with 73,6 MHz.

Gain = -6dB.

⑨ 1.4 MHz diplexer and amplifier.

Voltage gain = +23 dB.

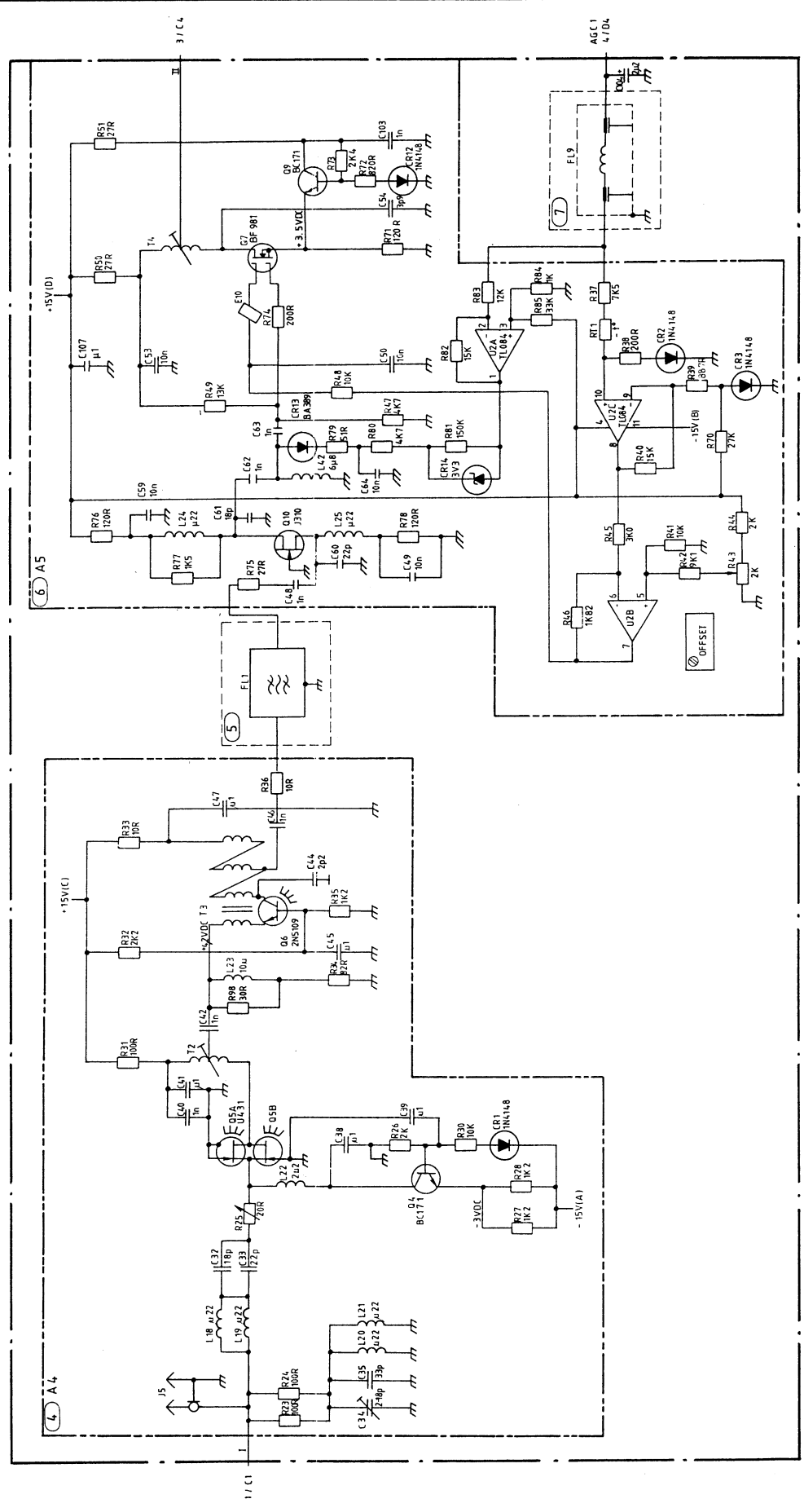
⑩ Information filterbank.

The diodes at the input and at
the output of the filters switch
the corresponding X-tal filter
on, controlled by the logical le-
vel applied to U4. A logical 1
(+5V) switches the filter on.

Voltage gain = -18 dB.

1 2 3 4

REVISIONS		
ZONE	DESCRIPTION	DATE
C1	EM 81154	820208
C2	EM 84104	23.8.84
	EM 86006	9.9.86
	EM 87035	12.5.87
	EM 87059	08.10.87
	EM 87090-92-93-96	26.11.87
E	EM 88078	VH
	EM 89136	VH



FIRST ANGLE PROJECTION	SIZE A2	CODE IDENT NO 448206	DRAWING NO 448206
		SCALE	SHEET 2 OF 2

⑪ Filtering circuit for bias voltages.

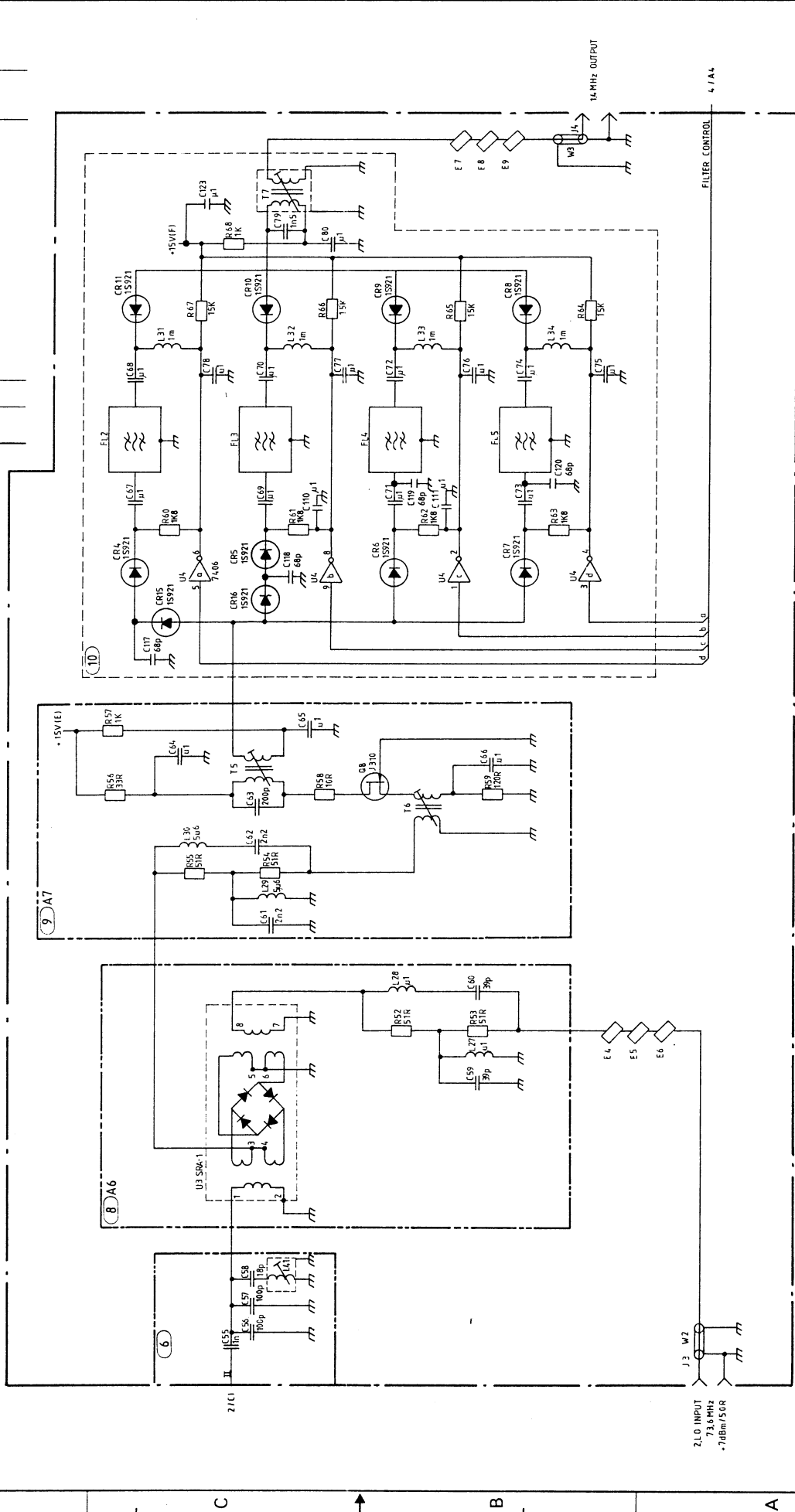
⑫ Microcomputer interface circuit.

The address of the module is FF26.

When the five least significant address bits are applied to the assembly in inverted form, output U5-5 follows \overline{WR} . On a positive transition of \overline{WR} , data is loaded into U6 and appears at the Q-outputs. \overline{TIACK} (A11) follows \overline{WR} provided that the correct address is present.

SIZE	CODE IDENT NO	DRAWING NO
A2		448206
SCALE		SHEET 3

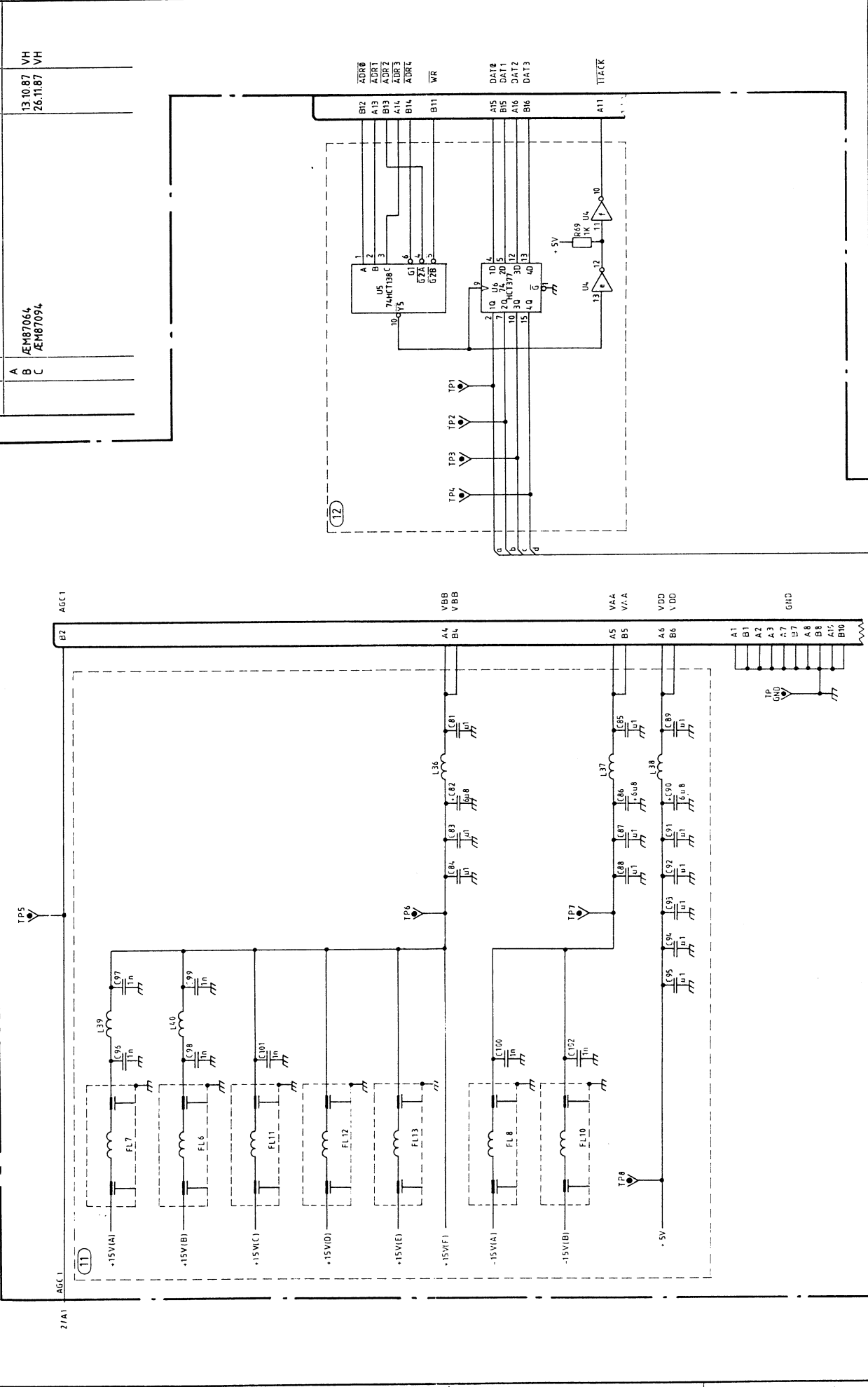
FIRST ANGLE PROJECTION



REVISIONS

ZONE LTR	DESCRIPTION	DATE	APPROVAL
C 4	ÆM81085	8/08/19	GS
	ÆM 86005	8.9.86	VH
	ÆM87035	12.5.87	VH
	ÆM8704.7 OG ÆM8704.8	3.7.1987	VH
	ÆM87094	26.11.87	VH
E	Æ09136	18.6.90	VH

REVISIONS			
ZONE	LTR	DESCRIPTION	DATE
A		MEM87064	13.10.87
B		MEM87064	26.11.87
C			
			VH
			VH



FIRST ANGLE PROJECTION		NO. 448206	SHEET 4
SIZE A2	CLASS		
SCALE			

ASSY 448389, 458155, PRESELECTOR ASSEMBLY

Service Sheet A4

① Bus Interface.

When the correct address is present, the output of U1 follows the write input pulses, thereby clocking datawords from the bus to the outputs of U2.

U3 and U4 forms a 1 out of 16 decoder with open collector outputs.

The signals "MUTE", "RNGØ" and "RNGF" are not used.

② Relay circuit.

A range is selected by applying a "0" to one of the wires 1 to E.

All relays are SPSTNO.

③ Supply line filters.

At 500 kHz K21 and K22 are closed and K20 is open.

- (14) 100-160 kHz, 160-270 kHz, 535-900 kHz and 900-1600 kHz.

At 100-270 kHz K23 is closed.

At 535-1600 kHz K23 and K24 are closed.

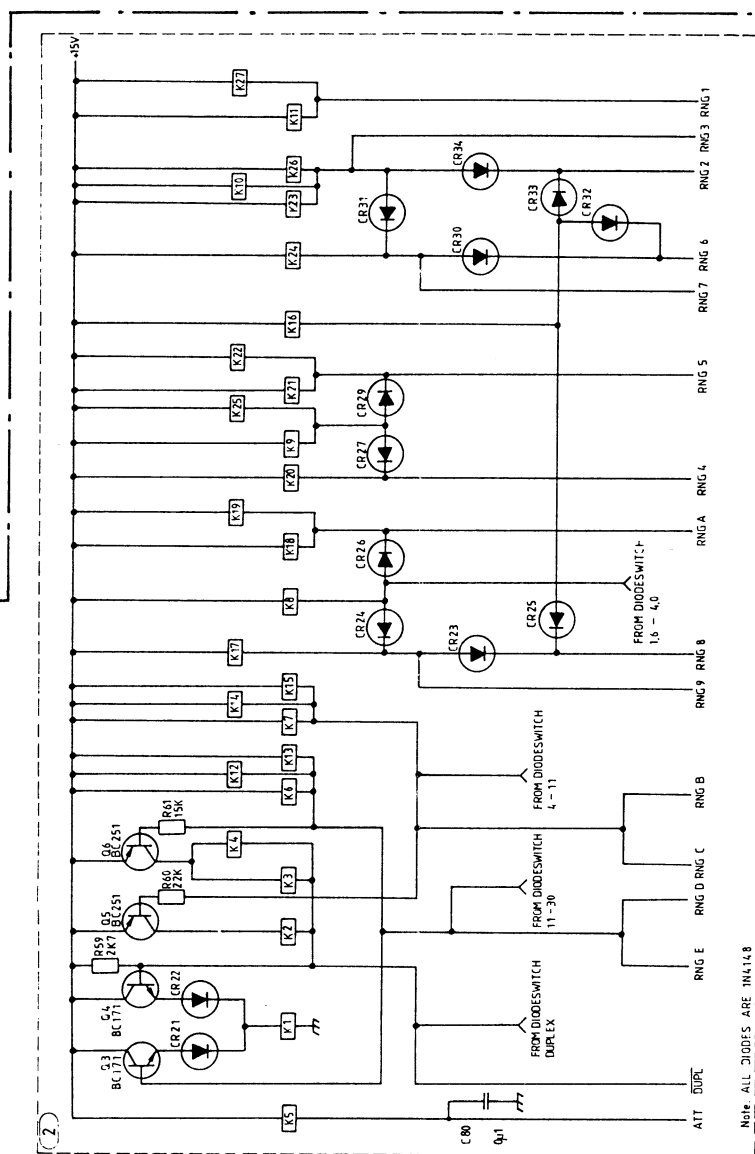
C44, L28 and C45 forms a 1.6 MHz LP filter.

- (15) Wideband 1.6-30 MHz.

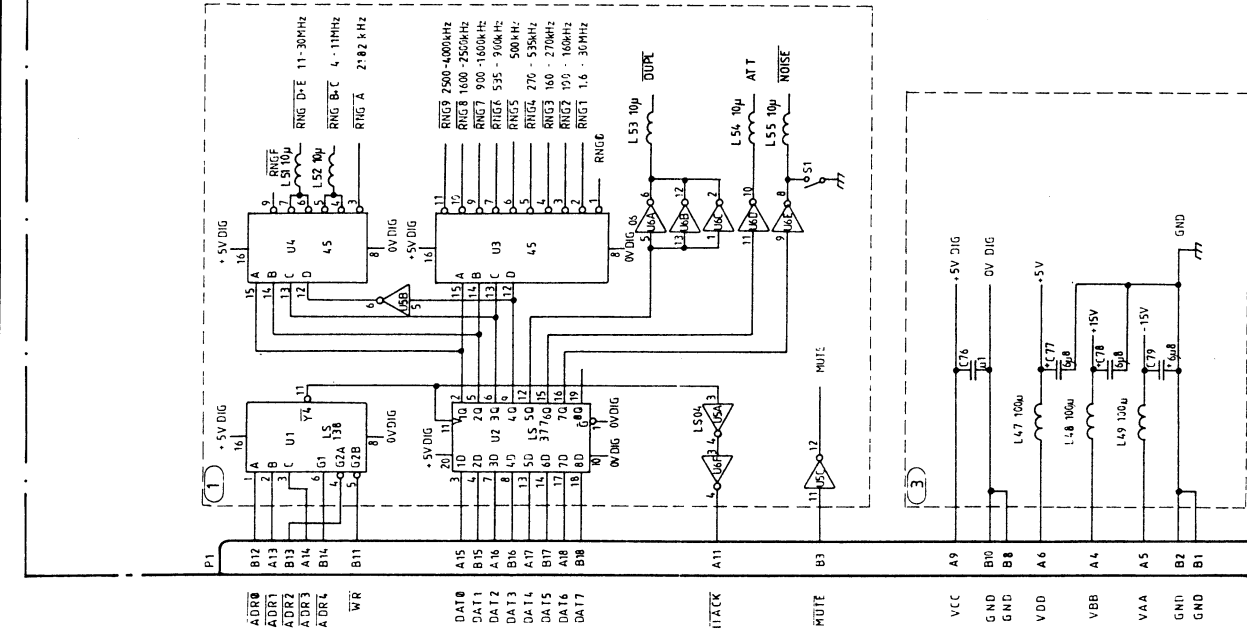
L31, C46 and L50 forms a 1.6 MHz HP filter.

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVAL
BC-3	A	AM81018	810303	
S 2,3	B1	AM814,8	820205	GS
2	C	AE09042	4.3.90	VH



Danks Radio AS		PRESELECTION, MARINE, DUPLEX	
TITLE: 80.08.24		NO.: 448389	
CH: 80/124		CLASS: A2	
AP: P5P		SCALE: 1 OF 3	
AP: P5P		FIRST ANGLE PROJECTION	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES IN ACCORDANCE WITH DS 2075		MATERIAL: M 3000	
ANGLES: LIN. DIM:		USED ON	
APPLICATION		NEXT ASSY	



(4) Input protection clipper.

The output signal at C6 is limited to 10Vpp by CR1 and CR2.

The noise output is coupled through R20 and C9 to the receiver input line.

(5) Input protection detector.

At frequencies above 5 MHz Q1 will conduct when the RF voltage at C1 exceeds 10 Vpp, thereby lowering the bias voltage at CR1 and CR2. This tends to make the clipping level frequency independant, as CR4 and CR5 are fast switching diodes.

(9) Input attenuator. (20 dB)

(10) 11-30 MHz BP- filter.

(11) 4-11 MHz BP filter.

K16 is closed in the ranges 100-160 kHz, 535-900 kHz and 1.6-2.5 MHz to parallel the section of C21.

(12) 1.6-2.5 MHz, 2.5-4.0 MHz and 2182 kHz.

The antenna reactans is tuned out by L21 (or L22 at 2182 kHz) in series with C21 while the antenna resistans is terminated through the broadband transformer L16.

L17, C31 and L18 forms a 1.6 MHz HP filter.

L19, C33 and L20 forms a 4 MHz LP filter.

At 2182 kHz K17 is open and K18, K19 are closed.

(13) 270-535 kHz and 500 kHz.

The antenna reactans is tuned out by L26 in series with C21 and the antenna resistance is terminated through the fixed BP filter formed by L23-L25 and C37-C39.

(6) Duplex filters 4, 6 and 8 MHz.

Opt.003

The series circuits are tuned to the center of the shipsTx duplex bands.

(7) Duplex filters 12, 16, 22 and 25MHz.

Opt.003

When the duplex mode is selected in these bands, K1 is opened while K3 and K4 are closed.

The series circuit are tuned to the center of the ships Tx duplex bands.

The tuning of L8 and L9 shall be at equal positions.

(8) Noise generator.

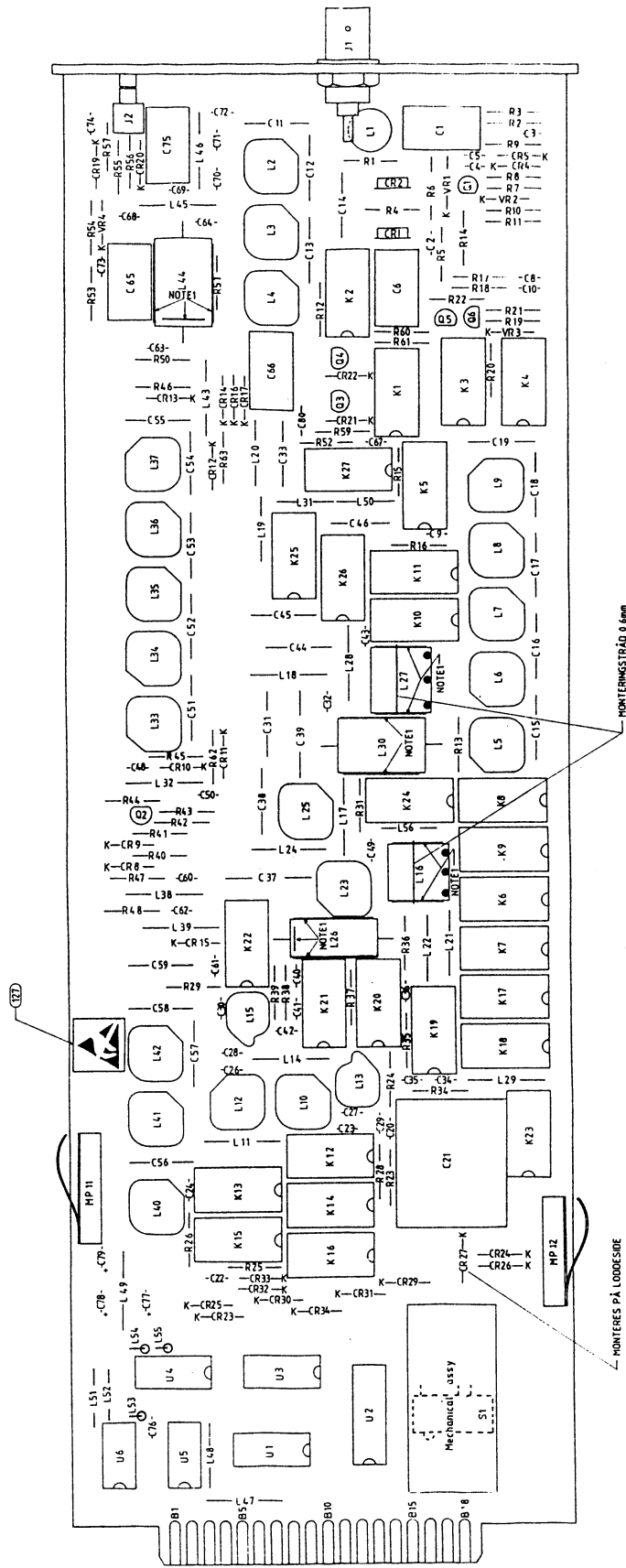
When a "0" is applied to R22 the zener diode VR3 is reverse biased through R19.

1. LINES MED (S) HVOR VINDINGEN SLUTTER



REVISIONS

ZONE/LTR	DESCRIPTION	DATE	APPROVAL
A	REVISED	9/12/02	W
B	AD09422	13/06	W
C	AD09422	18/10/00	W/GUS
D	AD09422	18/10/00	W/GUS
E	AD09422	18/10/00	W/GUS
F	AD09422	18/10/00	W/GUS



Dansk Radio AS		TITLE	
8809 Z6		PRESELECTION, MARINE DUPLEX	
DR 1/2	CH	AP	AP
FIRST ANGLE		PROJECTION	
SIZE		CODE IDENT	
44 83 89		A1	
DRAWING NO		SCALE	
SHEET 1 OF 1			

(16) Switch control circuit.

Opt.003

CR8, CR9 and Q2 are turned on when duplex mode is selected. R40 is grounded through CR8 thus preventing current from flowing to CR11 and CR12.

Through R47, CR15 are turned on.

Through R43, CR10 and CR13 are turned on when 11-30 MHz and duplex mode are selected.

When 11-30 MHz and simplex mode are selected, CR11 and CR12 are on through R40 while CR10 and CR13 are reverse biased through R44.

(17) Duplex filters 12, 16, 22 and 25 MHz.

In simplex mode CR11 and CR12 are on.

In duplex mode CR10 and CR13 are on.

The series circuit are tuned to the center of the ships Tx duplex bands.

The tuning cores of L36 and L37 shall be at equal positions.

(18) Diode switches.

CR14 is on at 11-30 MHz.

CR16 is on at 4-11 MHz.

CR17 is on at 1.6-2.5 MHz and 2.5-4.0 MHz.

A 10V reverse bias is applied to the diodes not used.

(19) Duplex filters 4, 6, 8 MHz.

In duplex mode CR15 is on.

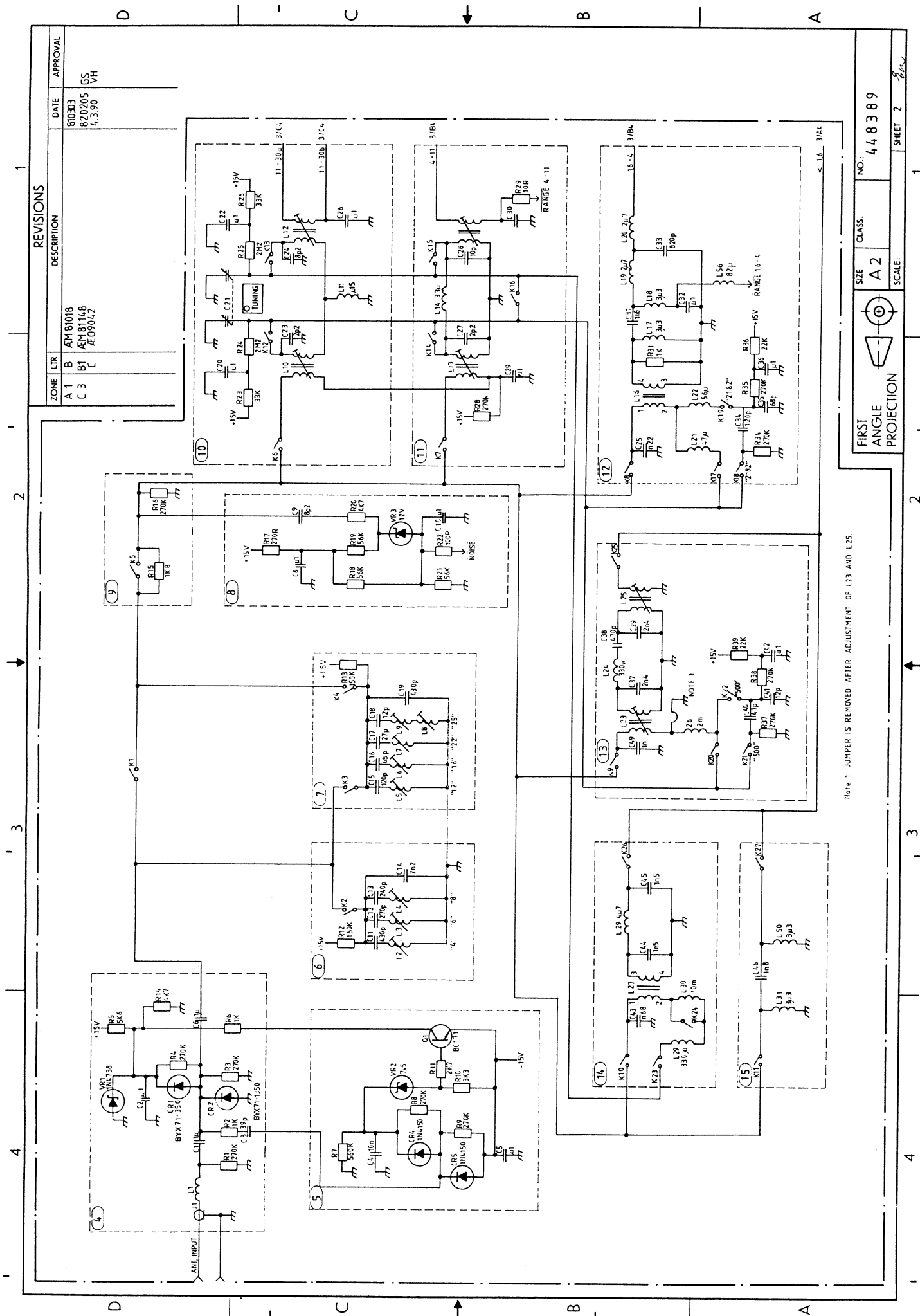
The series circuits are tuned to the center of the ships Tx duplex bands.

(20) 30 MHz LP filter.

(21) Relay contact bias circuit.

(22) Output protection circuit.

The output at C75 is limited to 6Vpp.



1. LINES MED (S) HVOR VINDINGEN SLUTTER

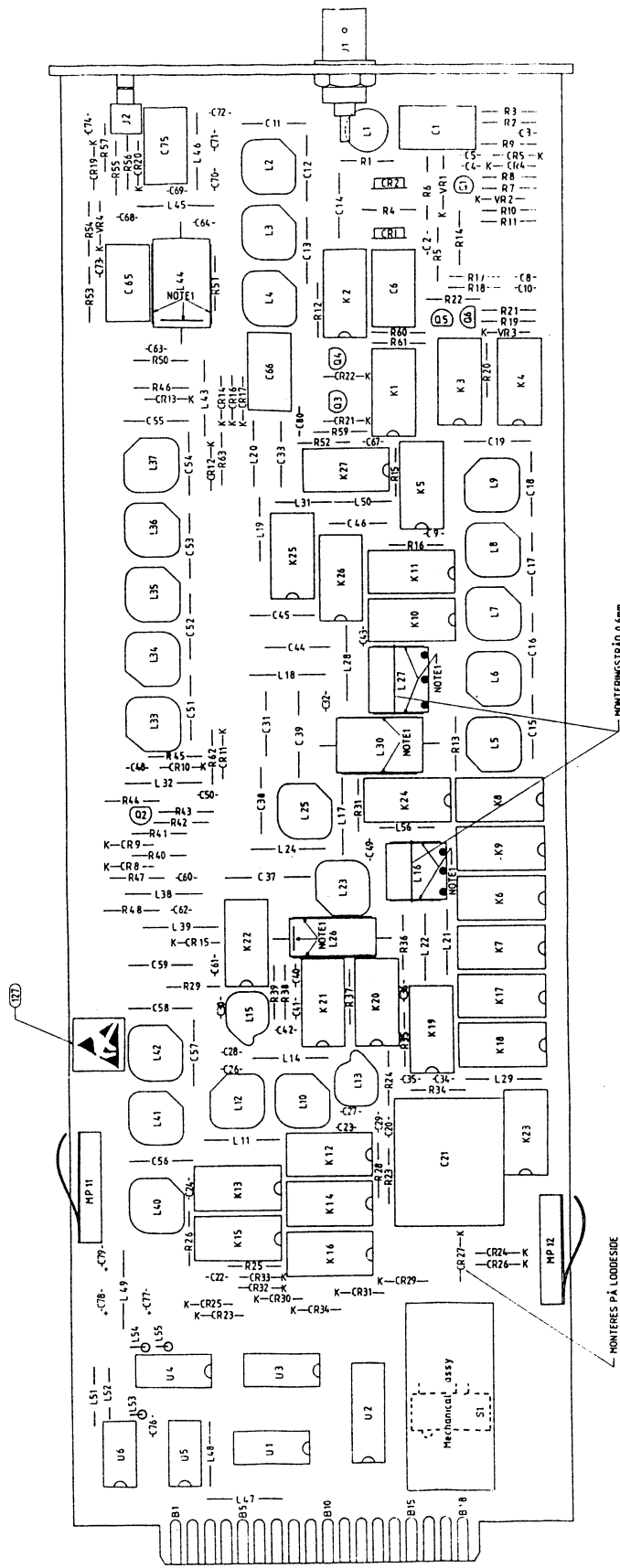
ESD BEHÅNDELT PER (S)

CAUTION

DEVICES ARE SUBJECT
TO ESD DAMAGE
STATIC ELECTRICITY

REVISIONS

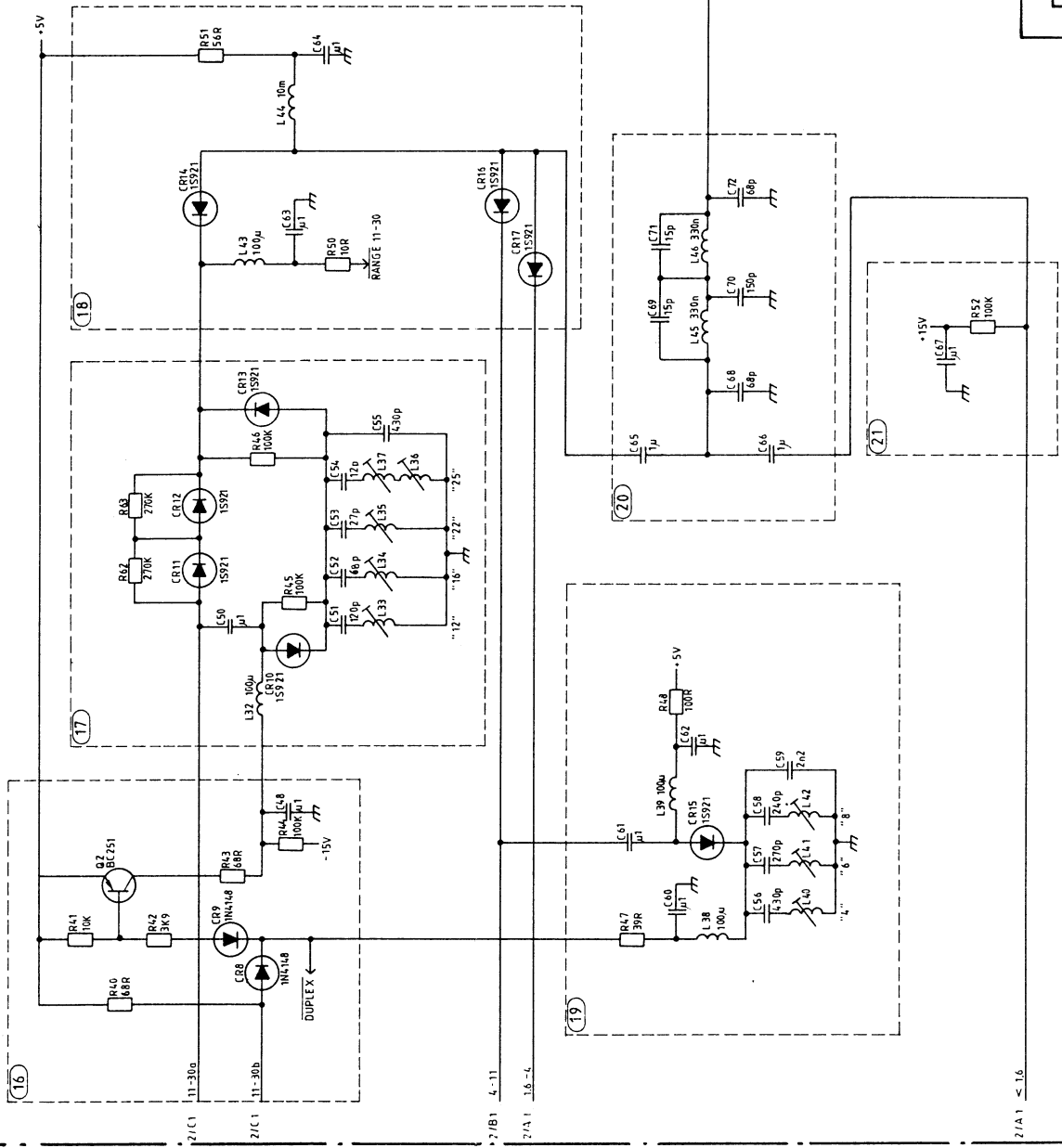
ZONE/LTR	DESCRIPTION	DATE	APPROVAL
A	REVISED	01.02.21	W
B	REVISION	17.08.20	W
C	REVISION	17.08.20	W
D	REVISION	28.11.20	W
E	REVISION	28.11.20	W
F	REVISION	11.12.21	W



Dansk Radio AS		TERMA	
TITLE		PRESELECTOR, MARINE DUPLEX	
DR 8009 26	CH 8009 26	AP 8009 26	AP 8009 26
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS AND DECIMALS ARE IN MILLIMETERS ACCORDANCE WITH ISO 875		SIZE CODE IDENT DRAWING NO A1 448389	
FIRST ANGLE PROJECTION		SCALE	
APPLICATION		SHEET 1 OF 1	

REVISIONS			
ZONE	LTR	DESCRIPTION	DATE
C 3	B1	AM 81148	020205
			GS

FIRST ANGLE PROJECTION		NO.: 448389
SIZE	CLASS:	SHEET 3
A 2	SCALE:	

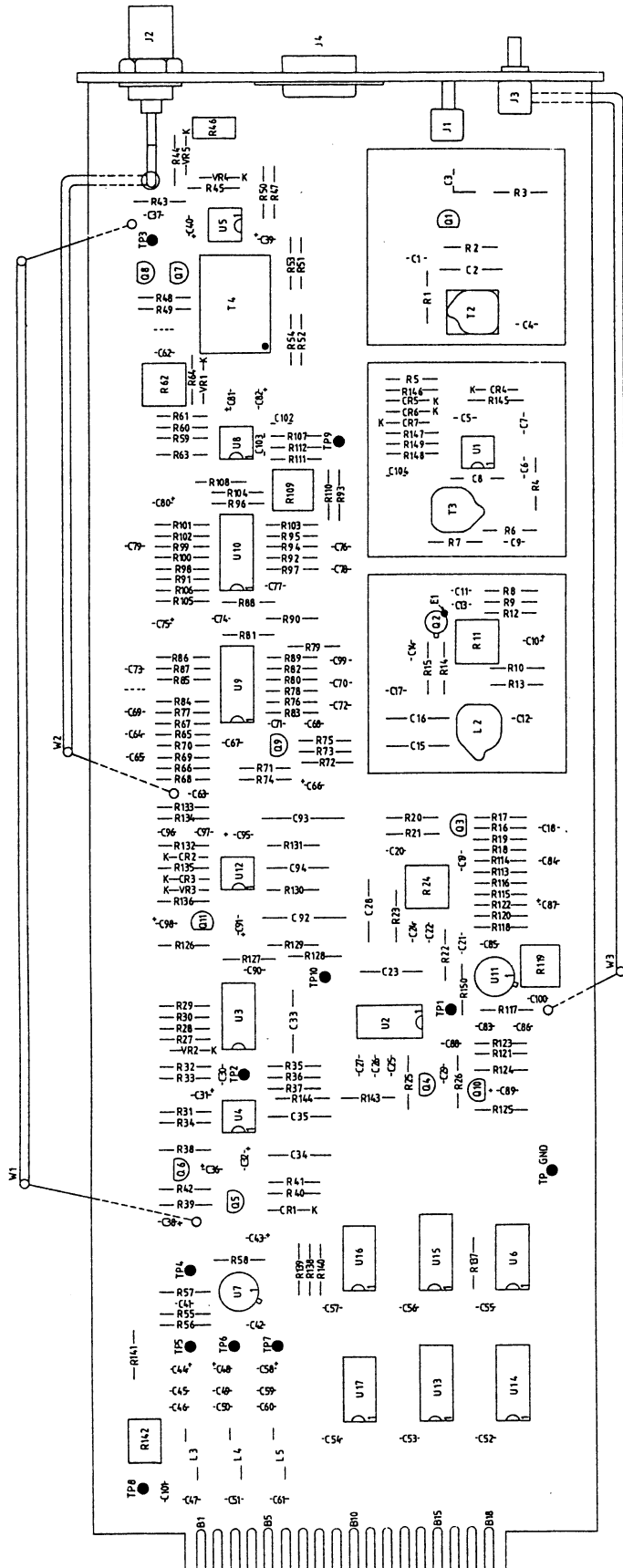


ASSY 448443, IF/AF ASSEMBLY

Service Sheet A7

- ① 1.4 MHz tuned amplifier
Voltage gain: +25 dB approx.
- ② 1.4 MHz Voltage controlled tuned amplifier.
Voltage gain: -40 dB to +50 dB approx. Controlled by the current through R5.
- ③ Dc-amplifier for AGC-voltage (AGC 2).
Offset adjustment (R62): With AGC-voltage AGC 2 equal to 0V the gain reduction of U1 (block 2) is adjusted to 1 dB by means of R62 (T-amb. = 24°C). The voltage range of the AGC-voltage AGC 2 is between 0V and +10V.
- ④ 1.4 MHz adjustable tuned amplifier.
Gain adjustment (R11): A 1.4 MHz/-107 dBm signal is applied to J1, IF-input. The signal IF-output, J2, is monitored. The adjustment in ③ is carried out first, then the signal at W2 is adjusted to -20 dBm/50Ω (63mV/50Ω) by means of R11.
- ⑤ Buffer amplifier for IF-output signal.
- ⑥ Logarithmic AGC-detector.
The AGC attack level is adjustable by means of R109. When the IF-output level is -20 dBm/50Ω, the nominal dc-voltage at TP 9 is 0V.
- ⑦ 1.4 MHz signal splitting amplifier.

REVISIONS		DATE	APPROVAL
BC 2	A	8/10/96	
DESCRIPTION			
C3	B	21/11/97	
B1	D	26/11/97	
B1	E	4/3/98	



Dansk Radio AS		TITLE
80 0929		SIGNAL PROCESSING, IF - 2ND, AUDIO
DR B.D.	CH	AP
4 578 4.1	M 3000	4 4 84 4.3
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS AND DECIMALS ARE IN MILLIMETERS ACCORDANCE WITH DS 2019		SCALE
FIRST ANGLE PROJECTION		1
APPLICATION		2
NEXT ASSY		3
USED ON		4
SHEET 1 OF 1		1

8 Synchronous AM-detector.

The detector gain is adjustable by means of R24. Nominal AF-voltage at TP 3 is 100 mV-rms (280 mV-pp) when the AM-signal is modulated to 50%/1 kHz.

9 DC-voltage switch for block 8.

A logical 1 applied to U6a-3 switches the dc-voltage on. The switch is on in mode AM, only.

10 Balanced SSB/CW Demodulator.

The demodulator gain is adjustable by means of R119. Nominal AF-voltage at TP 3 is 100 mV-rms (280 mV-pp) @ 1 kHz.

11 DC-voltage switch for 10 .

A logical 1 applied to U6e-5 switches the dc-voltage on. The switch is on in modes SSB and CW, only.

12 Mode selection switch.

The correspondence between the selected mode and the logical level at the control inputs is as follows:

Control input			
Mode	U3-13	U3-5	U3-12,6
AM	1	0	0
SSB, RTTY	0	1	0
CW/Wide, inter	0	1	0
CW/vnar, navr.	0	0	1

A logical 1 corresponds to +12V

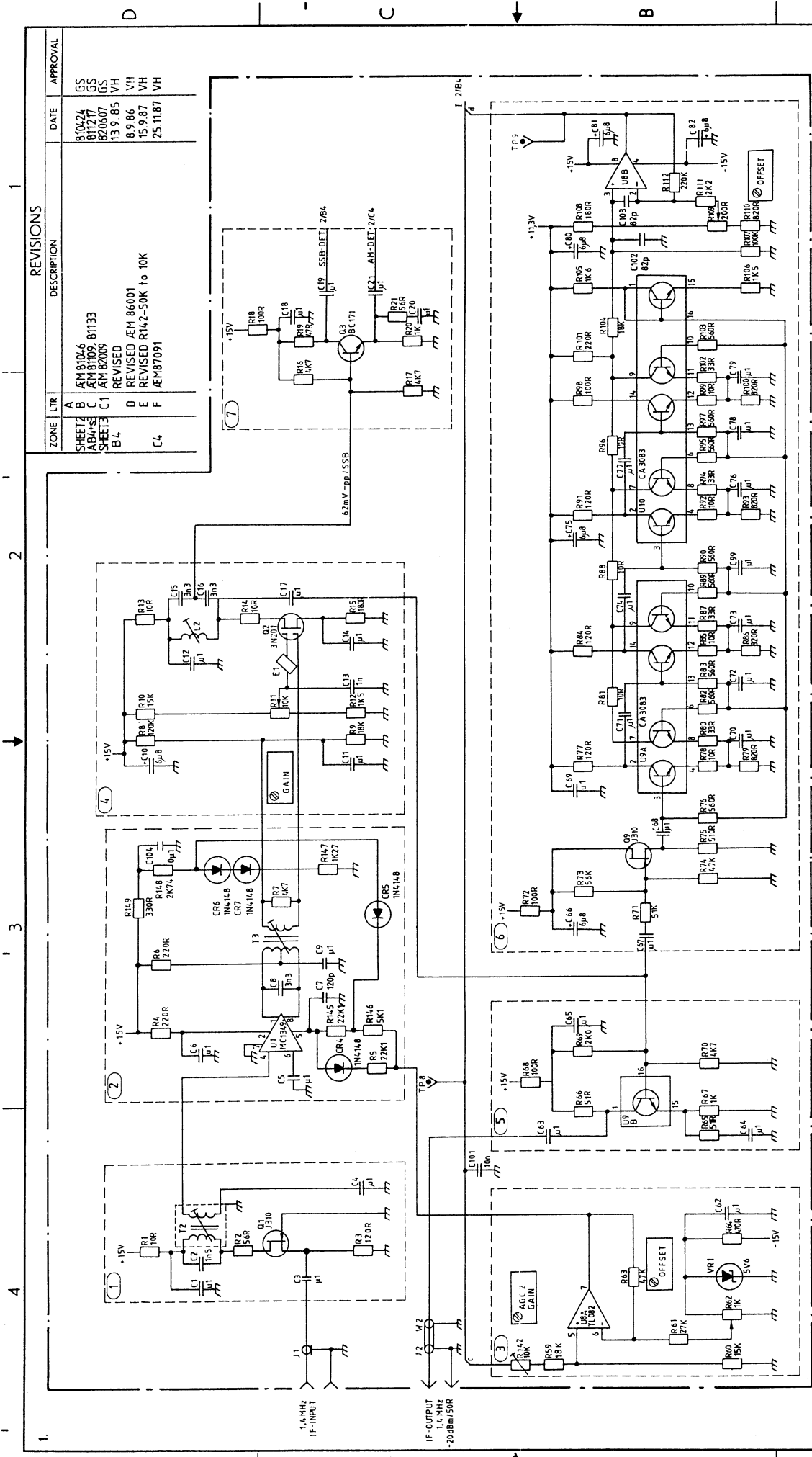
A logical 0 corresponds to 0V

13 1.4 kHz LP-filter.

The filter is inserted after the Demodulator in mode CW/vnar. and CW/narr.

14 LF-amplifier. Voltage gain: 30dB.

Nominal voltage level at TP2: 115mV-rms (322mV-pp).



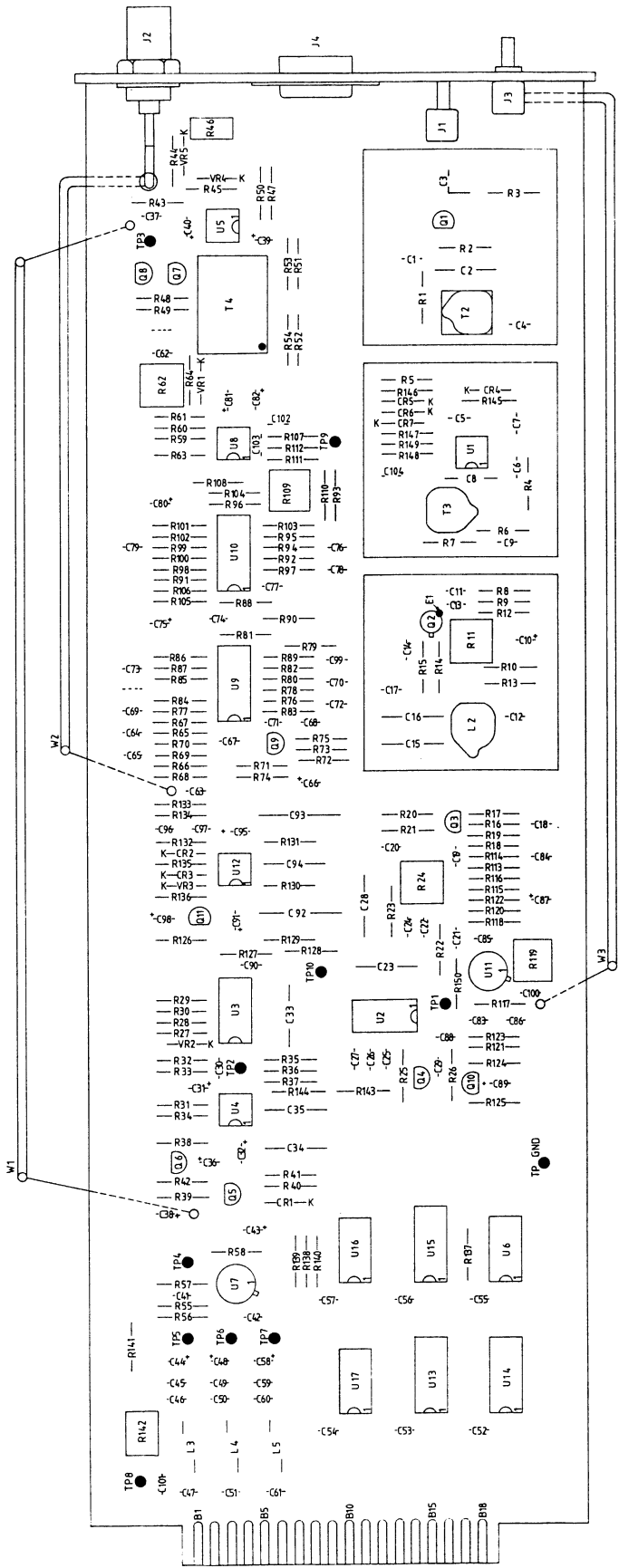
REVISIONS		DANSK RADIO AS	
ZONE	DESCRIPTION	DATE	APPROVAL
A	AM 81046	810424	GS
B	AM 81059, 81133	811277	GS
C	AM 82009	820607	GS
D	REVISED	13.9.85	VH
E	REVISED AM 86001	8.9.86	VH
F	REVISED R142-50K to 10K	15.9.87	VH
G	AM 87091	25.11.87	VH

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLI- METRES AND TOLERANCES IN ACCORDANCE WITH DS 2075		DANSK RADIO AS	
488240	RX4009	DR: 80 09 04	TITLE: SIGNAL PROCESSING, IF - 2ND, AUDIO.
475467	OCEANIC	CH: 800922	
477885	RX3000	AP: 800922	
477172	RX4000	AP: 800922	
465429	M 3000		
NEXT ASSY	USED ON		
APPLICATION		FIRST ANGLE PROJECTION	
		SIZE: A2	CLASS: 448443
		NO.: 448443	
		SCALE: 1:1	SHEET 1 OF 3

REVISIONS

ZONE/ITER	DATE	DESCRIPTION
BC 2	A	EN 81031
C3	B	EN 81046
B1	C	REVISED EN 84001
	D	EN 81091
	E	EN 81091

421117	89 86	VH
26 1187	VH	
43 90	VH	



Dansk Radio AS		dra	
TITLE		SIGNAL PROCESSING, IF - 2ND, AUDIO	
DR B.D.	00 09 79	CH	634
AP	634	AP	634
FIRST ANGLE PROJECTION		CODE IDENT	
A1		DRAWING NO	
A1		44 84 43	
SCALE		SHEET 1 OF 1	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS AND DECIMALS THEREOF		APPLICATION	
4.5 7 8 4.1		M 3000	
NEXT ASSY		USED ON	
1		2	
3		4	

(15) 4 kHz LP-filter.

(16) Muting circuit.

A logical 1 applied to U6f-1 forces Q5 to go on, thus shortcircuiting the signal path.

(17) Signal Detector.

When a signal is present in the signal path a logic 0 appears at TP10.

(18) Line Amplifier.

Output level up to +10 dBm/ 600 Ω adjustable by means of R46 which is accessible through a hole in the rear panel. Nominal voltage level at TP3: 100mV-rms (280 mV-pp).

(19) 11.3V Voltage Regulator for the AGC-detector circuit. Voltage tolerance: +/- 0.7 V

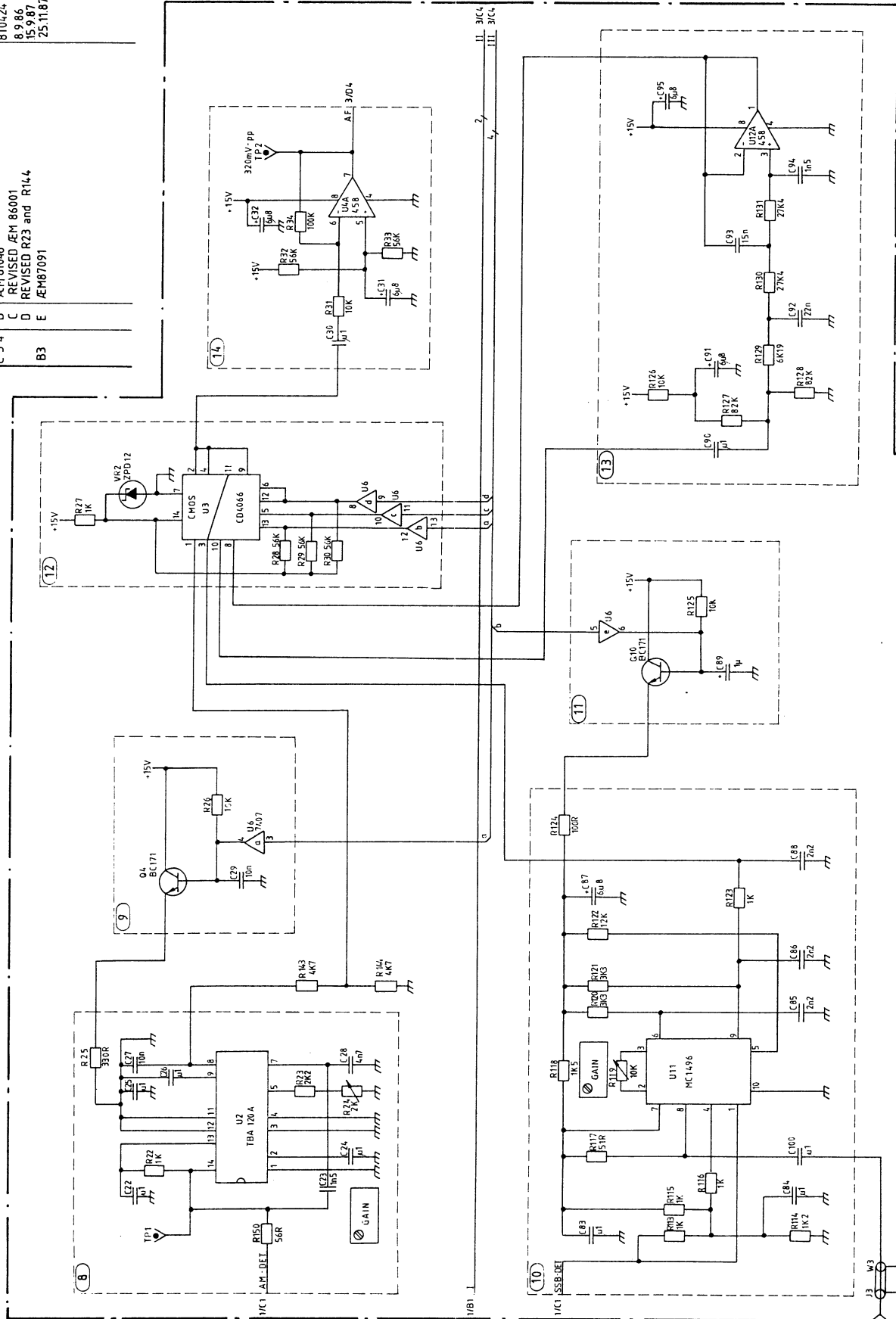
(20) Filtering circuit for bias voltages.

(21) Microcomputer interface circuit.

The address of the assembly is FF29. When the five least significant address bits are applied to the module in inverted form, U13-9 goes low. This enables U14 and U15. On a positive transition of \overline{WR} data is loaded into U14 and appears at the Q-outputs. A logical 0 at \overline{RD} en-

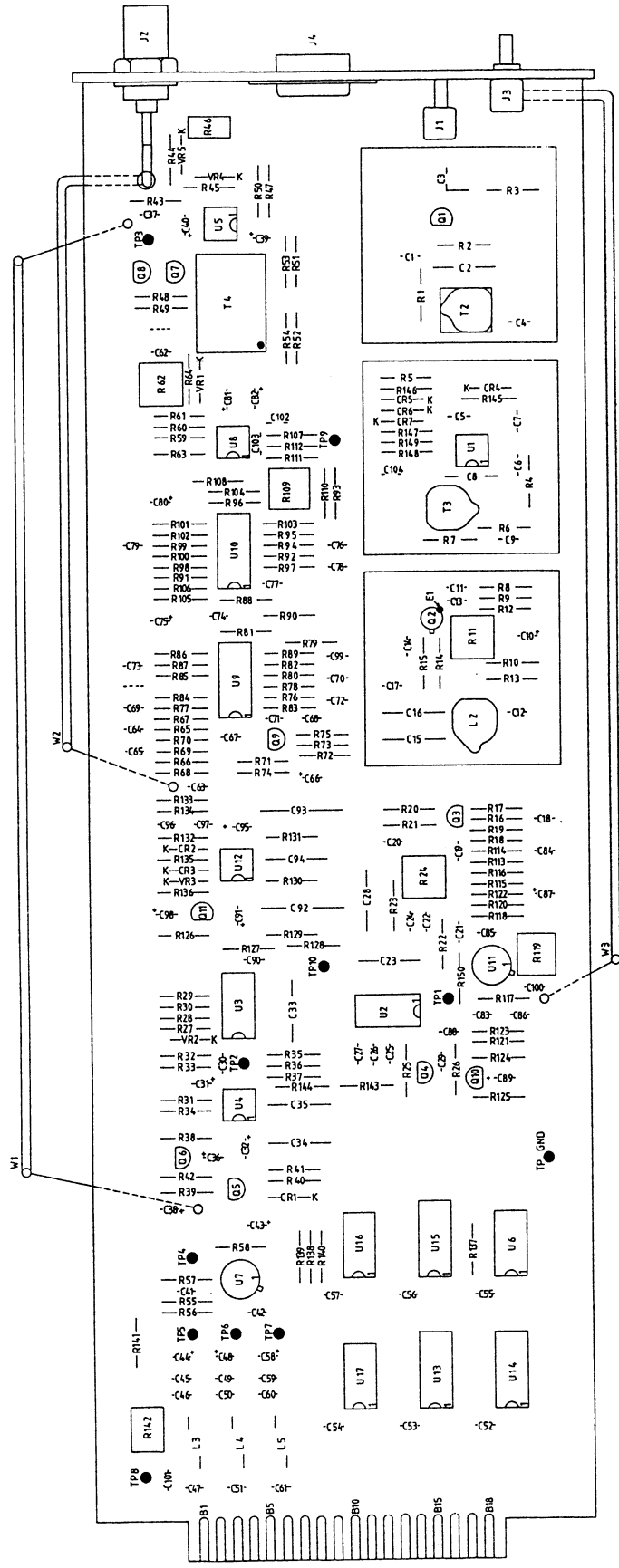
ables three-state buffer U15, provided that U15-15 is at logical 0. Thus data at input U15-2 is fed to connector P1-A15 (DAT 0). \overline{ATACK} (A11) goes low when \overline{RD} or \overline{WR} goes low provided that the correct address is present.

REVISIONS			DATE	APPROVAL
ZONE/LTR	DESCRIPTION			
C 3-4	AM 81046		810424	GS
B	REVISED AM 86001		8986	VH
C	REVISED R23 and R144		95987	VH
B3	AM87091		25.11.87	VH

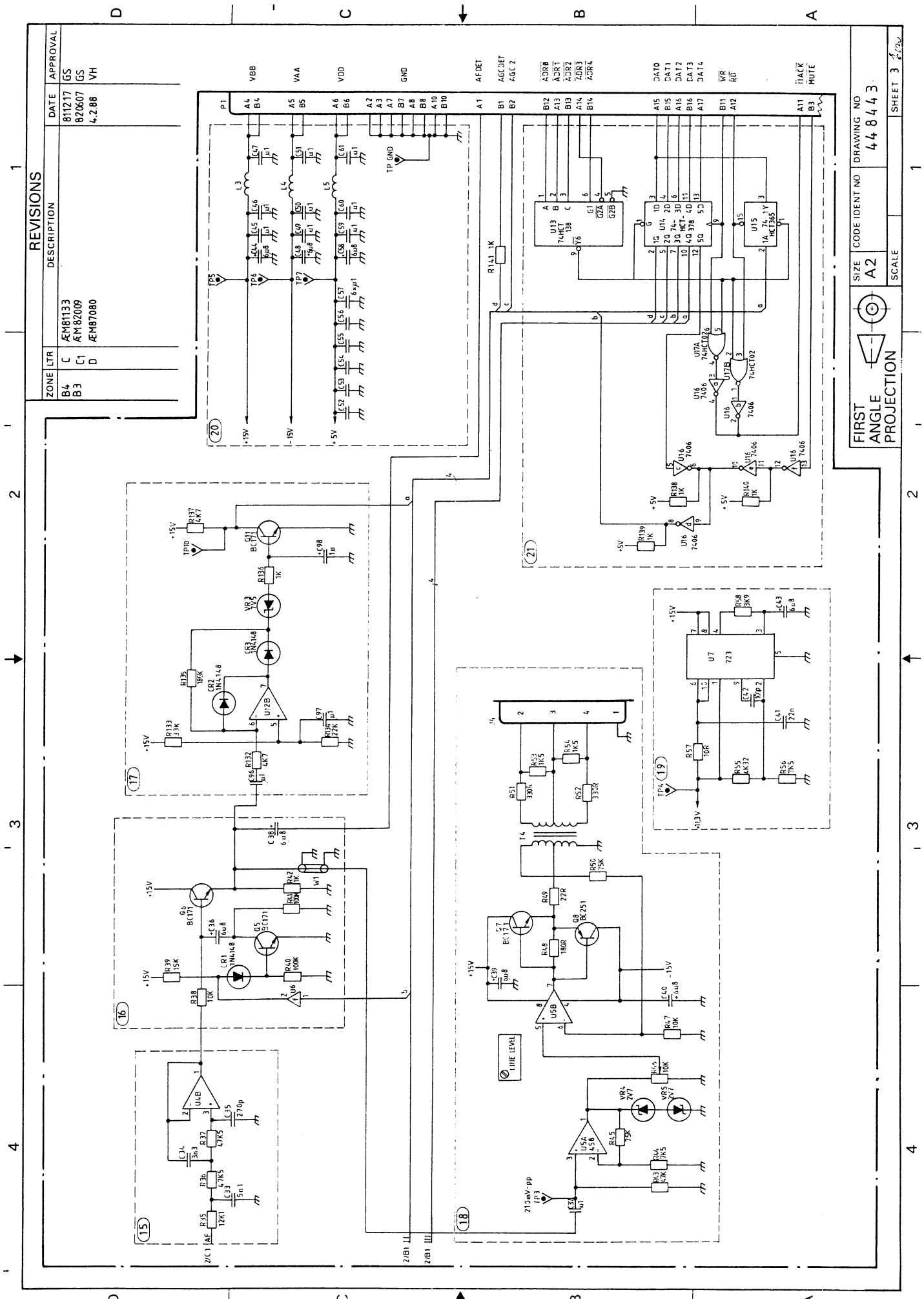


FIRST ANGLE PROJECTION	SIZE A2	CODE IDENT NO 448443	DRAWING NO 448443
	SCALE		SHEET 2 of 2

REVISIONS		DATE	APPROVAL
ZONE	DESCRIPTION		
BC2	A	8/10/31	
C3	B	8/10/36	
	C	8/10/46	
	D	8/10/56	
	E	8/10/59	
	F	8/10/59	



Dansk Radio AS		TITLE	
DR B. D.		80.09.23	
CH		SIGNAL PROCESSING, IF - 2ND, AUDIO	
AP		4.84.4.3	
FIRST ANGLE		A1	
PROJECTION		SCALE	
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS AND TOLERANCES ARE AS SHOWN ON DRAWING.		CODE IDENT. DRAWING NO.	
L. S. 784.1		4.84.4.3	
NEXT ASSY		USED ON	
APPLICATION		SHEET 1 OF 1	



ASSY 448478, MICROCOMPUTER ASSEMBLY

Service Sheet A8

① U1: 8085 microprocessor with associated 6.144 MHz crystal for internal clockstabilisation.

U12: Eight-bit latch for multiplexing address line DB0-DB7.

U13: Buffer for command signals etc.

② Watch-dog for surveillance of correct start-up and system software operation.

At system start-up R4, C1 ensures that a reset pulse of approx. 10 msec is generated. This pulse is routed to the microprocessor through U2.

U2: Retrigger astabile multivibrator with a period of 1 s. Under normal operation, the software ensures that U2 is retriggered at appropriate intervals so that the reset signal to the microprocessor is disabled. Appearance of software error causes the retrigger to cease and reset pulse generation will start-up.

③ Timer that starts counting when $\bar{O}\bar{F}\bar{F}\bar{B}\bar{D}\bar{R}\bar{E}\bar{Q}$ goes low.

If the timer counts out, no acknowledge-signal has been received within the last 16 ms, and a Trap-interrupt is generated to the microprocessor.

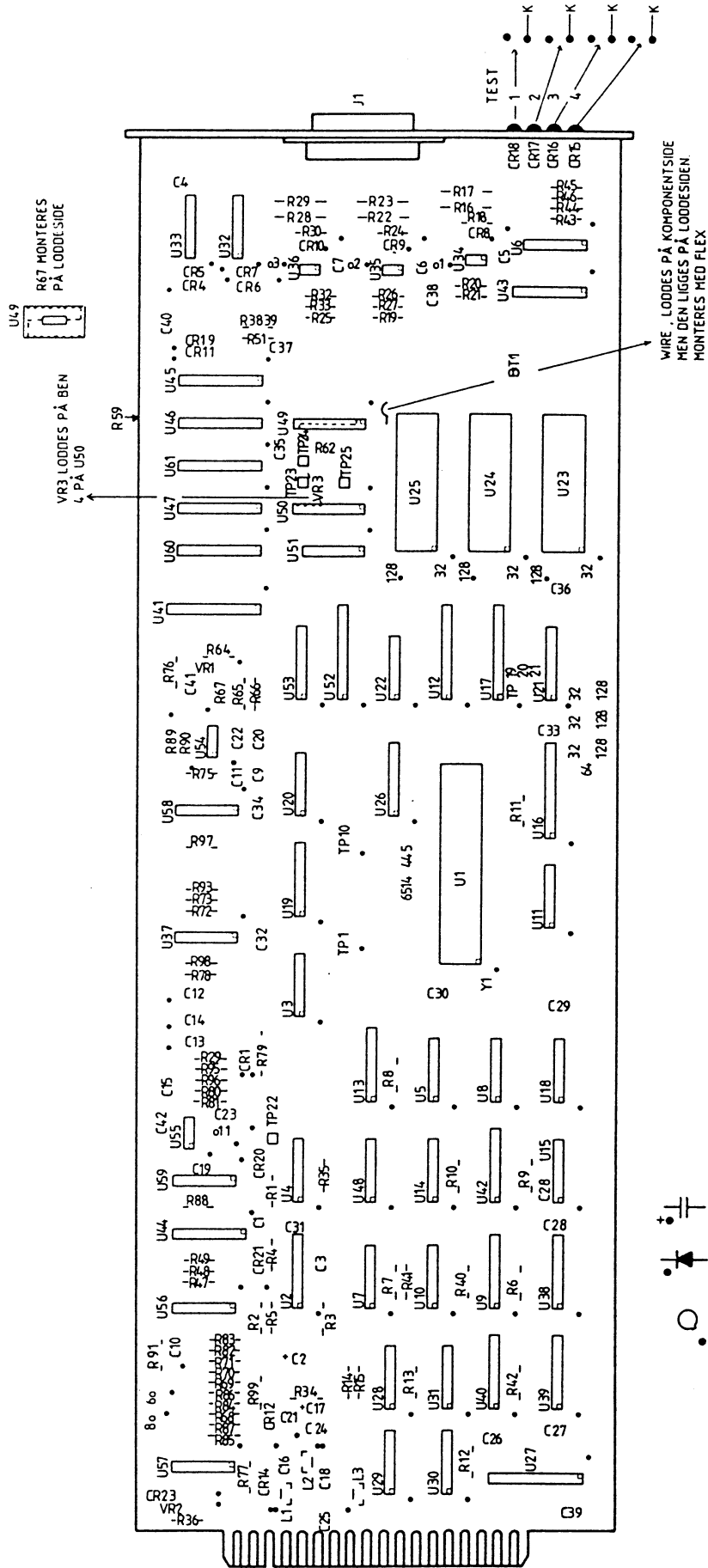
In normal operation, acknowledge-signals should be received within 16 ms.

④ Network that converts an acknowledge-signal to a ready-signal to the microprocessor.

⑤ The flip/flop U14 delays the start of $\bar{W}\bar{R}$ -signal one half of a CLK-period, which ensures that BUFEN-signal delays the enable of buffer U17 in accordance with the timing.

$\bar{O}\bar{F}\bar{F}\bar{B}\bar{D}\bar{R}\bar{E}\bar{Q}$ and $\bar{O}\bar{F}\bar{F}\bar{B}\bar{D}\bar{W}\bar{R}$ are only generated if no acknowledge-signal on board has been received before start of BUFEN.

REVISIONS			DATE	APPROVAL
ZONE/LTR	DESCRIPTION			
A	ARM 84106, REVISED		05.05.07 VII	
B			24.2.90 VII	
C				



Dansk Radio AS			TITLE		COMPONENT LOCATION		DRAWING NO		SHEET 1 OF 1	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075			DR	VH 75 185	CH		SIZE	A2	SCALE	1:1
ANGLES			AP		AP		FIRST ANGLE			
LIN DIM			AP		AP		PROJECTION			
MATERIAL			AP		AP					
NEXT ASSY			AP		AP					
USED ON			AP		AP					
APPLICATION			AP		AP					

⑥ U16: Eight-bit buffer which are enabled during "free-running" i.e. when \overline{TEST} is low. When "free-running" is selected U16 forces the microprocessor to read NOP-instructions, regardless of the microprocessor addressing.

⑦ U17: Eight-bit bidirectional data bus buffer, which is enabled during on board operations.

⑧ Address decoding for generating on board chip selects for I/O operations. An acknowledge-signal $\overline{I/O-AA\overline{CK}}$ is generated for every I/O-address, as handshaking signal to the microprocessor.

⑨ Address decoding for generating on board chip selects for memory operations. An acknowledge-signal $\overline{MEM-AACK}$ is generated for every memory address; as handshaking signal to the microprocessor.

The S1, S2, S3 strap fields determine the address range of $\overline{CS1}$, $\overline{CS2}$, $\overline{CS3}$

S1,S2,S3	32	64	128
CS1	0-FFFFH	0-1FFFFH	0-3FFFFH
CS2	1000-1FFFFH	2000-3FFFFH	4000-7FFFFH
CS3	2000-2FFFFH	3000-4FFFFH	8000-BFFFFH

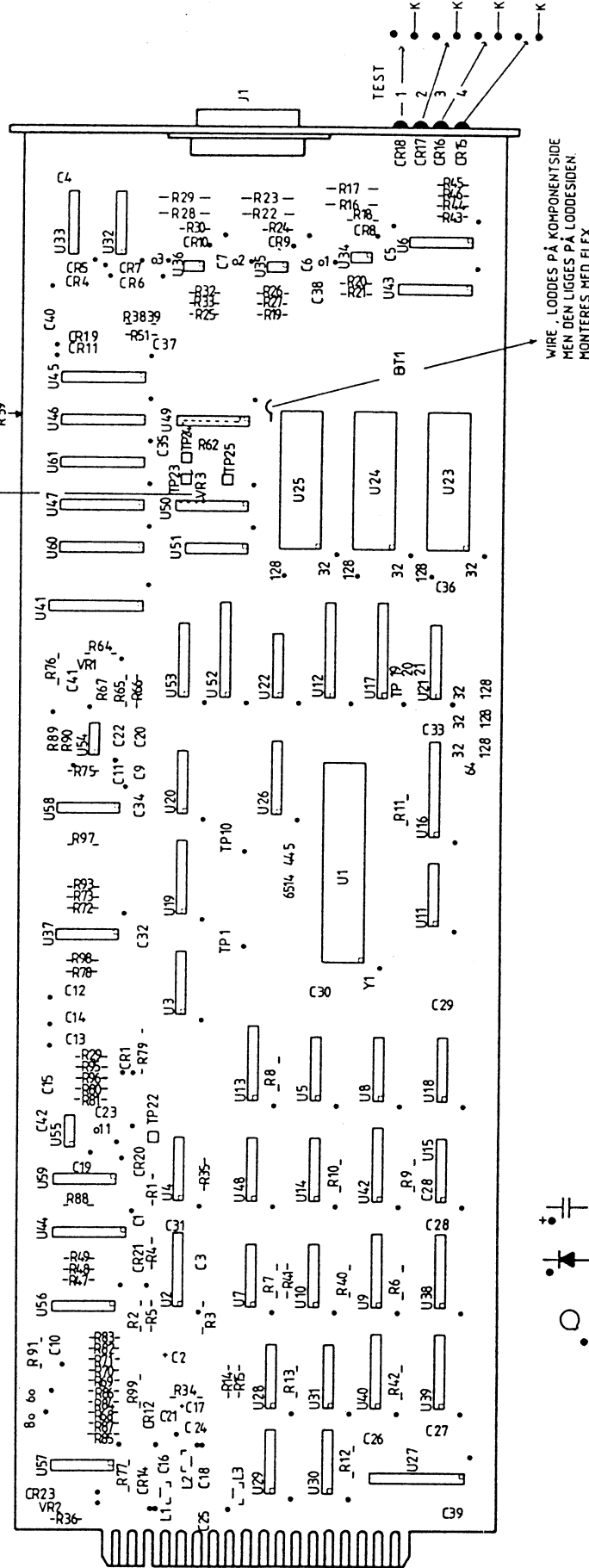
The HM-6514-9 and $\mu PD444$ may be strapped in accordance to the used type of CMOS-RAM. The strapping provides that the timing for the used type of CMOS-RAM is correct.

REVISIONS			DATE	APPROVAL
ZONE	LTR	DESCRIPTION		
A		FM 8406, REVISED	05 05 07 VH	
B			24 290 VH	
C				

VR3 LODDES PÅ BEN
4 PÅ U50

U69

R67 MONTERES
PÅ LODDESIDE



WIRE LODDES PÅ KOMPONENTSIDE
MEN DEN LIGGES PÅ LODDESIDEN
MONTERES MED FLEX

Dansk Radio AS		TITLE	
DR		VH 75 185	
CH			
AP			
AP			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE IN ACCORDANCE WITH DS 2075		COMPONENT LOCATION MICROCOMPUTER	
ANGLES		SIZE	
RX 4000		A2	
M 3000		CODE IDENT	
M 3000		DRAWING NO	
M 3000		44 84 78	
M 3000		SCALE 1:1	
M 3000		SHEET 1 OF 1	
APPLICATION		FIRST ANGLE PROJECTION	
NEXT ASSY		USED ON	
U1		U2	
U3		U4	
U5		U6	
U7		U8	
U9		U10	
U11		U12	
U13		U14	
U15		U16	
U17		U18	
U19		U20	
U21		U22	
U23		U24	
U25		U26	
U27		U28	
U29		U30	
U31		U32	
U33		U34	
U35		U36	
U37		U38	
U39		U40	
U41		U42	
U43		U44	
U45		U46	
U47		U48	
U49		U50	
U51		U52	
U53		U54	
U55		U56	
U57		U58	
U59		U60	
U61		U62	
U63		U64	
U65		U66	
U67		U68	
U69		U70	
U71		U72	
U73		U74	
U75		U76	
U77		U78	
U79		U80	
U81		U82	
U83		U84	
U85		U86	
U87		U88	
U89		U90	
U91		U92	
U93		U94	
U95		U96	
U97		U98	
U99		U100	

10 EPROM AREA.

The content of 2732 is 4K x 8 bit.

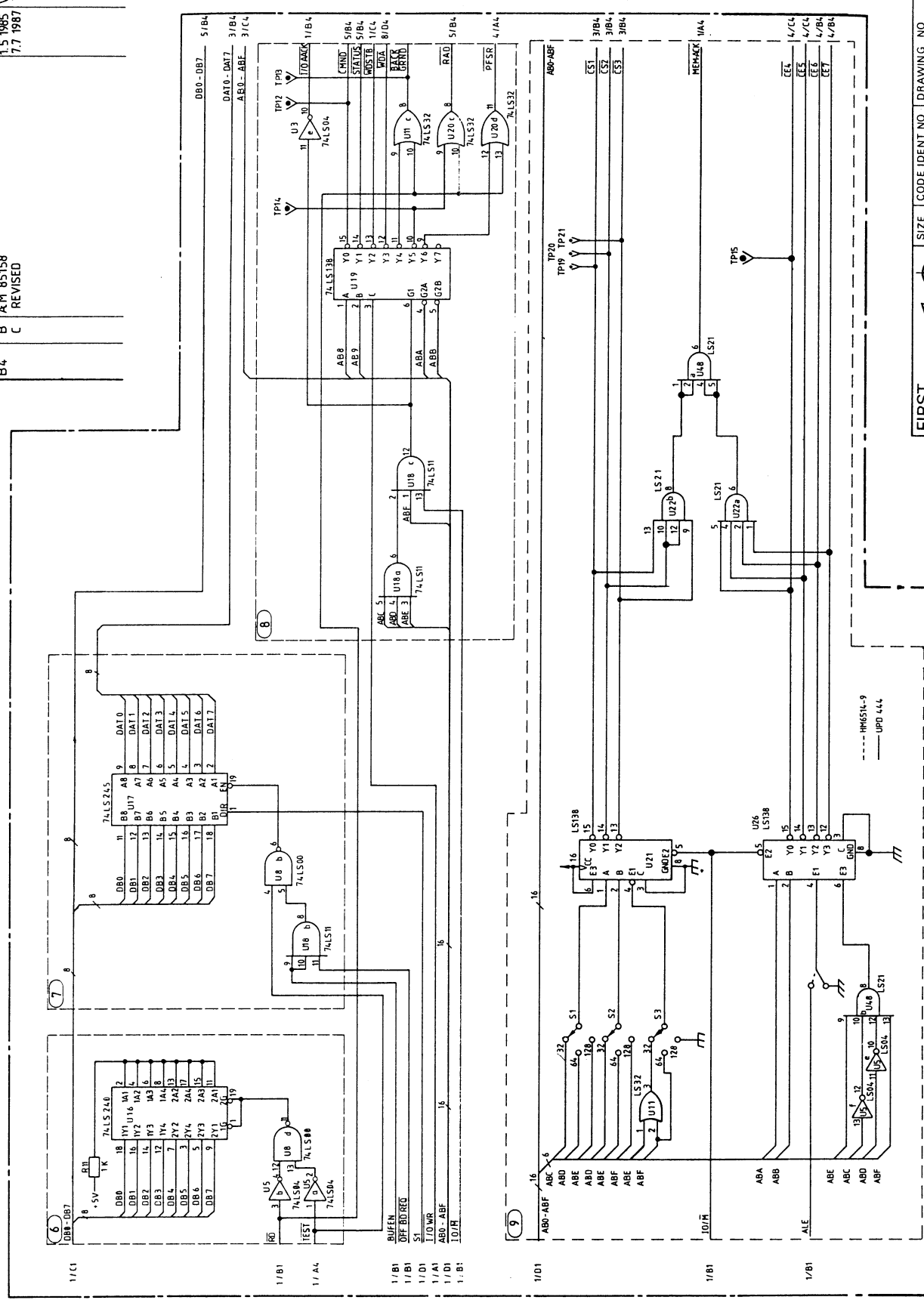
The content of 2764 is 8K x 8 bit.

The content of 27128 is 16K x 8 bit.

S1,S2,S3	S4	S5	S6	U23	U24	U25
32	32	32	32	2732	2732	2732
64	-	32	-	2764	2732	not used
64	-	-	32	2764	2764	2732
64	-	-	-	2764	2764	2764
128	128	32	-	27128	32	not used
128	128	64	-	27128	64	not used
128	128	128	64	27128	27128	64
128	128	128	128	27128	27128	27128

4 3 2 1

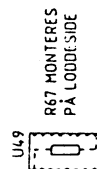
REVISIONS		
ZONE LTR	DESCRIPTION	DATE
B4	AM 85158	1.5 1985
B	REVISED	7.7 1987
C		VH



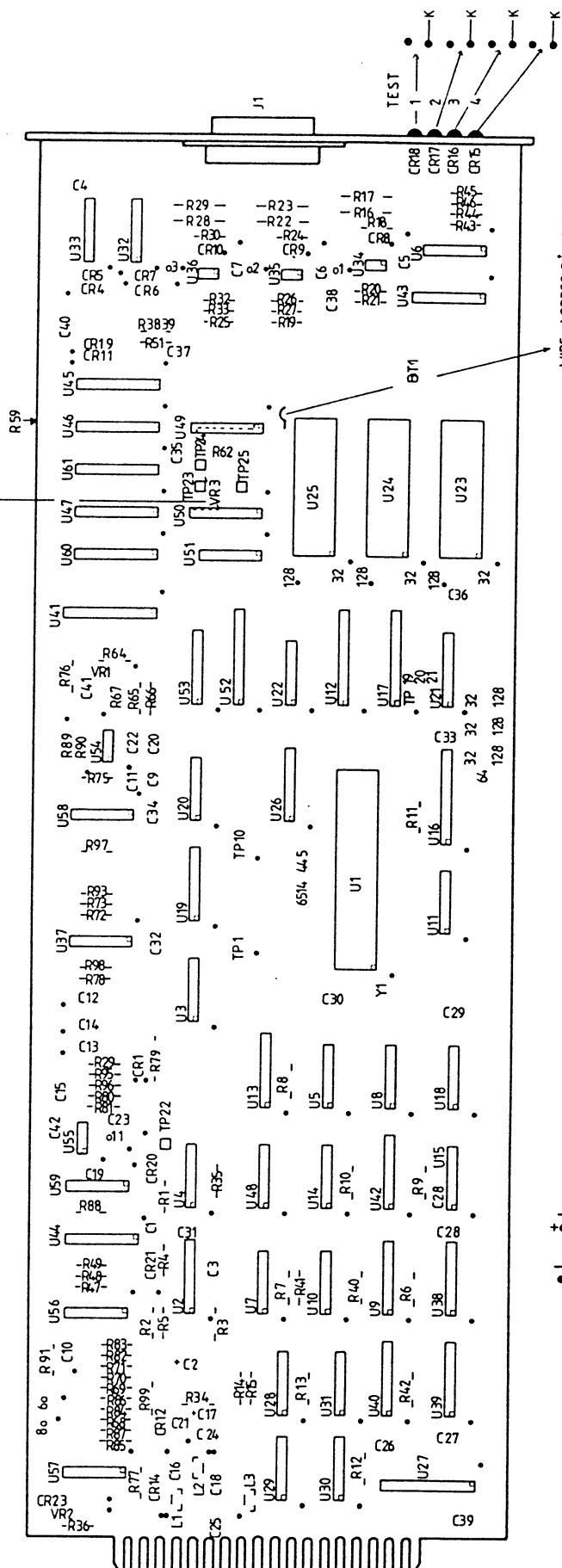
FIRST ANGLE PROJECTION	SIZE A2	CODE IDENT NO	DRAWING NO 448478
SCALE		SHEET 2	KK

4 3 2 1

REVISIONS			
ZONE	TR	DESCRIPTION	DATE
A		AM 84.06 . REVISED	05.05.07 VH
B			24.2.90 VH
C			



VR3 LODDES PÅ BEN 4, PÅ U50



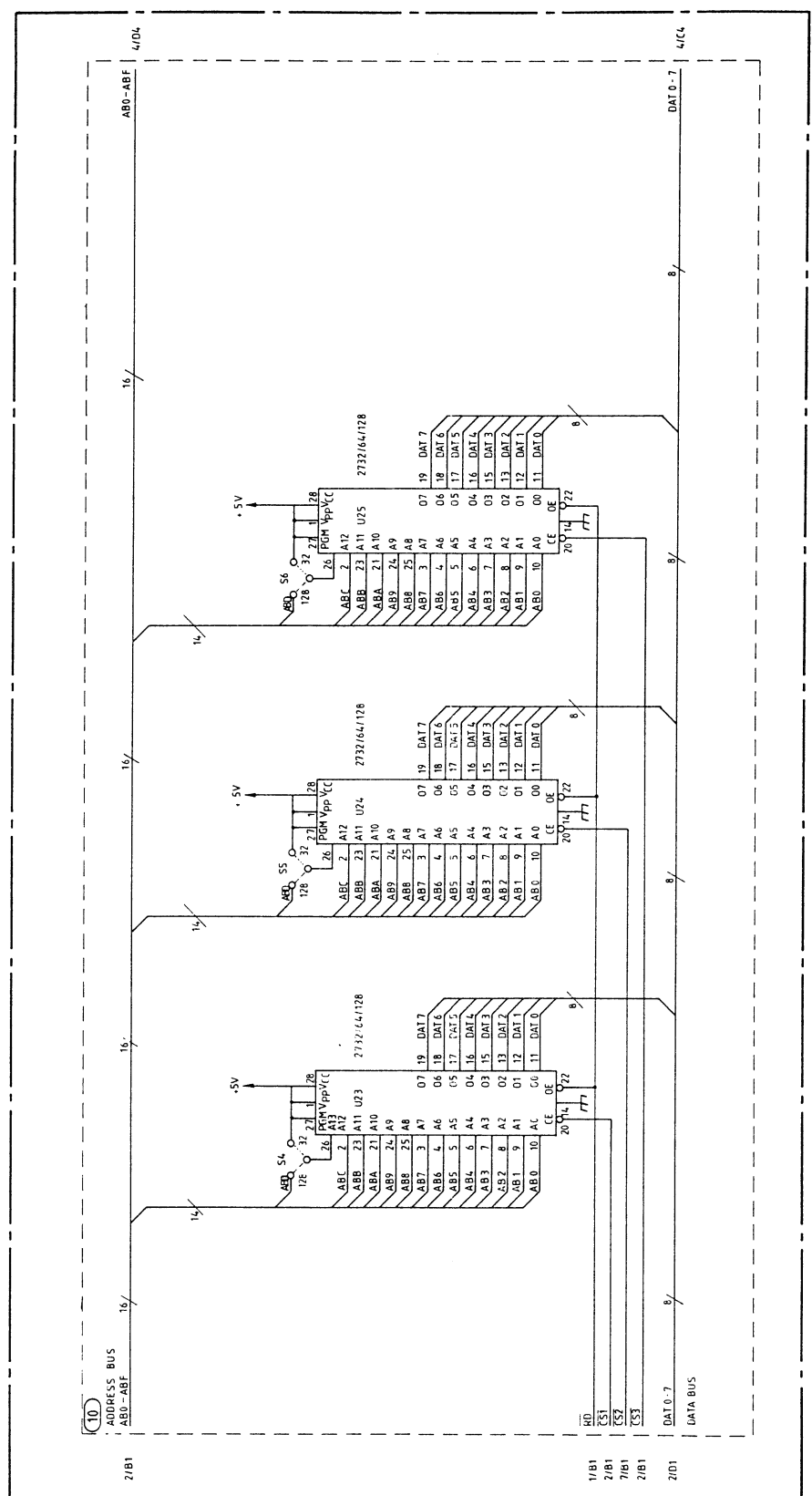
Dansk Radio AS			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075		TITLE	
ANGLES		DR	
LIN DIM		CH	
MATERIAL		AP	
NEXT ASSY		FIRST ANGLE PROJECTION	
APPLICATION		SIZE	
		CODE IDENT	
		DRAWING NO	
		44 84 78	
		SCALE 1:1	
		SHEET 1 OF 1	

COMPONENT LOCATION		MICROCOMPUTER	
DR		VH 7 5 1985	
CH			
AP			
MATERIAL			
NEXT ASSY			
APPLICATION			



- (11) Circuit that ensures power to CMOS-gates U49,50,51 and CMOS-RAM U47,60,61
BT1 is a lithium battery and R51 protects the battery against serious damage if a short circuit appears.
- (12) RAM-Area, consisting of two 1K x 4 bit U45-U46 working as one 1K x 8 bit. U47,60,61 is 1K x 4bit CMOS RAM, working as a continuous memory.
- (13) When power is removed intentionally by PWR OFF on the front panel U50a is set. The 'PWRL0' will interrupt the microprocessor. This will read the status of U50a and store relevant information in the CMOS RAM (U47,60,61) and hereafter protect the CMOS RAM against writing by setting U50b. During start up U50a will be cleared by RESET and the CMOS RAM will be enabled by clearing U50b.

1 2 3 4

REVISIONS			
ZONE/LTR	DESCRIPTION	DATE	APPROVAL
A	REVISED	85.05.07 VH	
B			



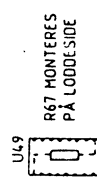
--- 27128
..... 2732

FIRST ANGLE PROJECTION			SIZE	CODE IDENT	DRAWING NO.
			A2		44 84 78
			SCALE		SHEET 3

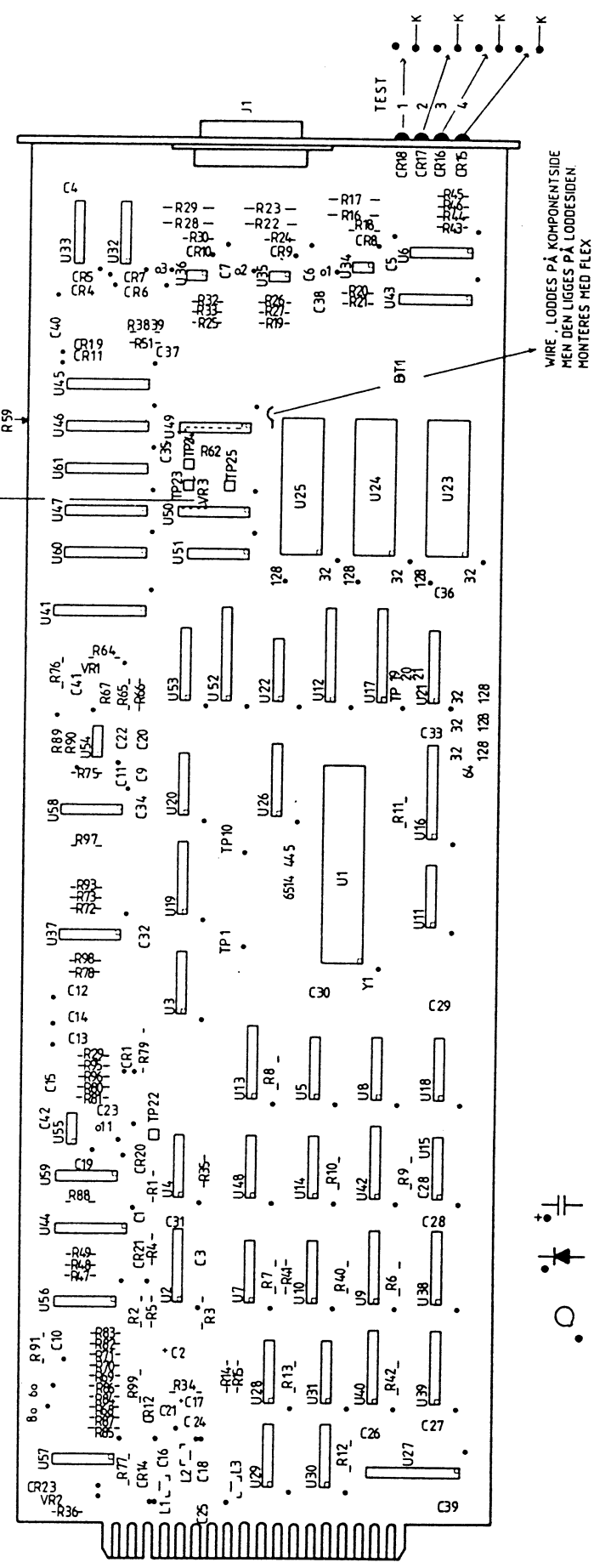
1 2 3 4

REVISIONS		
ZONE/LTR	DESCRIPTION	DATE
A	AM 84.106	85.05.07 VII
B	REVISED	24.2.90 VII
C		

1	2	3	4
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VR3 LODDES PÅ BEN
4 PÅ U50



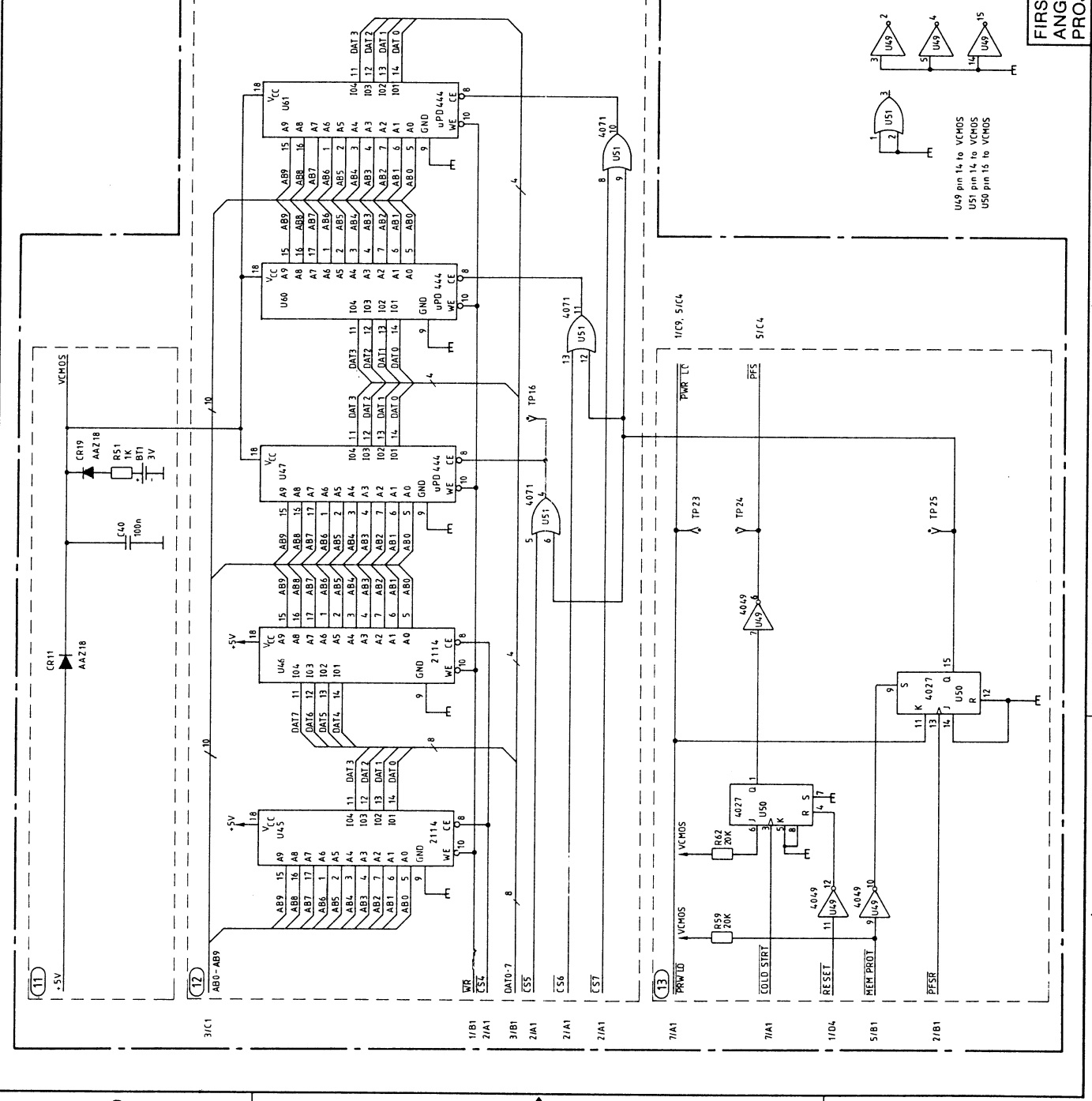
WIRE . LODDES PÅ KOMPONENTSIDE
MEN DEN LIGGES PÅ LODDESIDEN
MONTERES MED FLEX

Dansk Radio AS		TITLE	
DR		VH 75 1985	
CH			
AP			
AP			
FIRST ANGLE PROJECTION		COMPONENT LOCATION MICROCOMPUTER	
SIZE A2		CODE IDENT DRAWING NO 44 84 78	
SCALE 1:1		SHEET 1 OF 1	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE IN MILLIMETERS ACCORDANCE WITH DS 2075		APPLICATION	
ANGLES		NEXT ASSY USED ON	
LIN DIM			
MATERIAL			
471712 RX 4000			
457841 M 3000			
471909 RC4000			

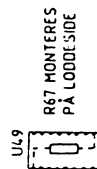
- ⑭ Timer that counts on the CLK-signal from the microprocessor
Output from the timer gives a RST 7.5 interrupt to the microprocessor for every 1ms, and a clock pulse to ③.
- ⑮ Eight bit input port.
- ⑯ U42:Eight addressable latches used for control signals.
U44:One out-of-four decoder with associated pull-up resistors, used for control signals.
- ⑰ Four bit latch with associated buffers and LED's.

REVISIONS		
ZONE/LTR	DESCRIPTION	DATE
A		
B	REVISED	850507 VH

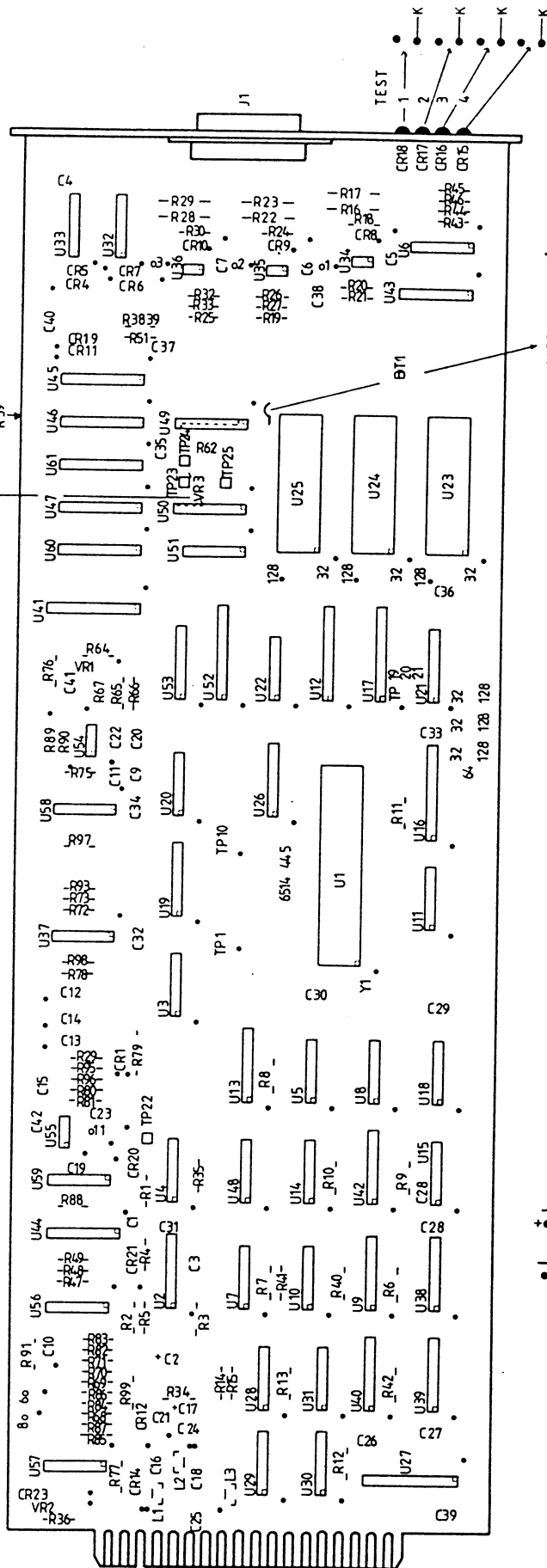


FIRST ANGLE PROJECTION	SIZE A2	CODE IDENT A2	DRAWING NO. 44 84 78	SHEET 4

REVISIONS		
ZONE/LTR	DESCRIPTION	DATE
A	AM 84106 . REVISED	05.05.07 VH
B		24.2.90 VH
C		



VR3 LODDES PÅ BEN
4 PÅ U50

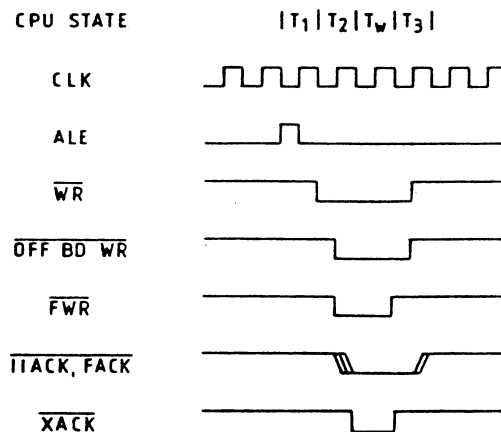


WIRE . LODDES PÅ KOMPONENTSIDE
MEN DEN LIGGES PÅ LODDESIDEN
MONTERES MED FLEX

Dansk Radio AS		dra	
TITLE		COMPONENT LOCATION	
DR	VH 7 5 1985	MICROCOMPUTER	
CH			
AP			
AP			
FIRST ANGLE PROJECTION		DRAWING NO	
		44 84 78	
APPLICATION		SCALE 1:1	
		SHEET 1 OF 1	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE IN ACCORDANCE WITH IS 2015		ANGLES	
		L IN DIM	
		MATERIAL	
		USED ON	
		NEXT ASSY	
		APPLICATION	

- (18) Supply filters.
- (19) U27: Eight bit bidirectional data bus buffer, which is enabled during off board operations.
- (20) Circuit to provide at least 1 wait-state in the micro-processor timing, during off board write operations. This ensures that data is valid on the rising edge of \overline{FWR} .

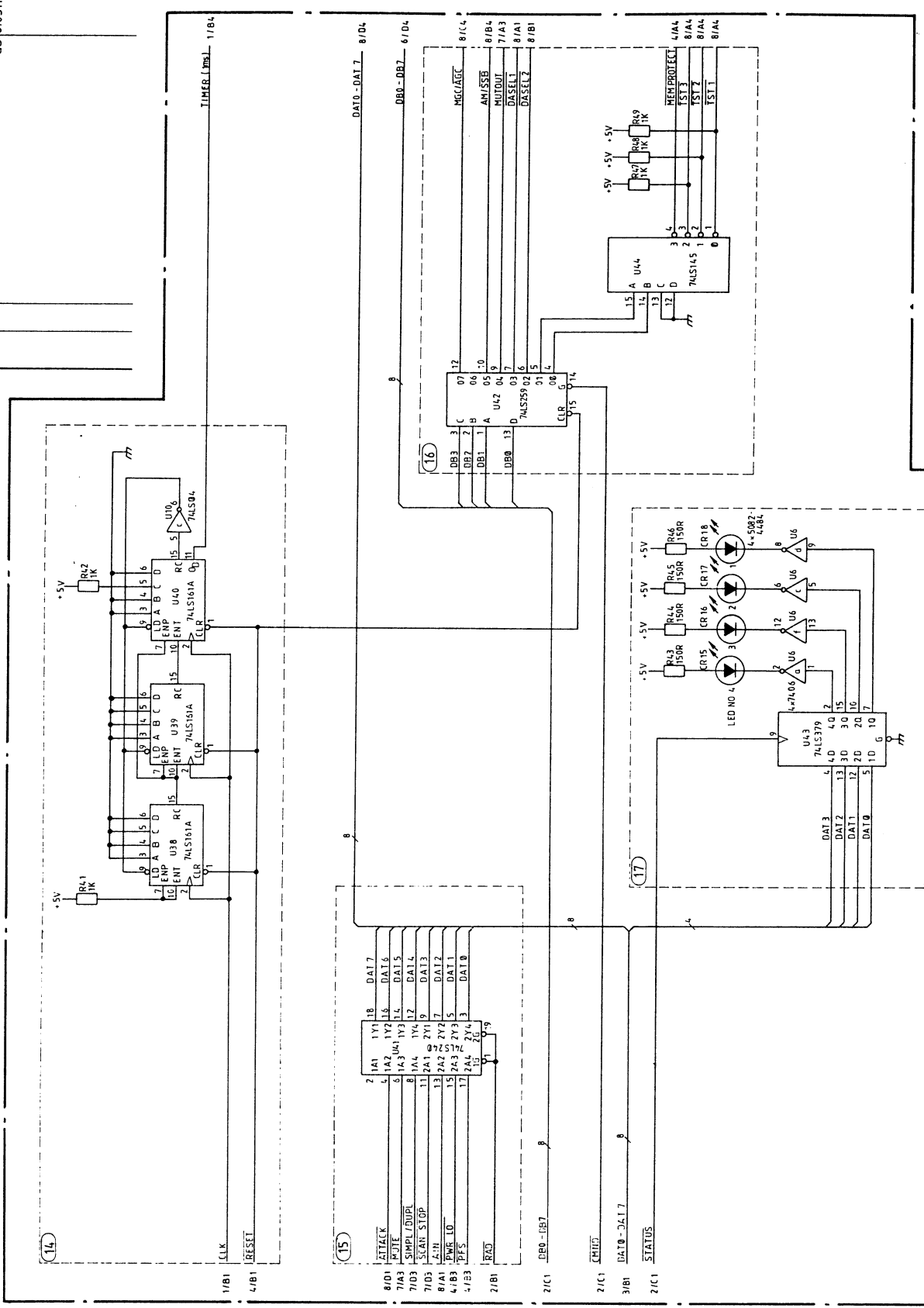


Timing diagram for generating of 1 wait-state,

- (21) Buffers for off board address- and command-signals.

4 3 2 1

REVISIONS			
ZONE	LTR	DESCRIPTION	DATE
C2	C	AM 80039	GS 8/03/11
APPROVAL			



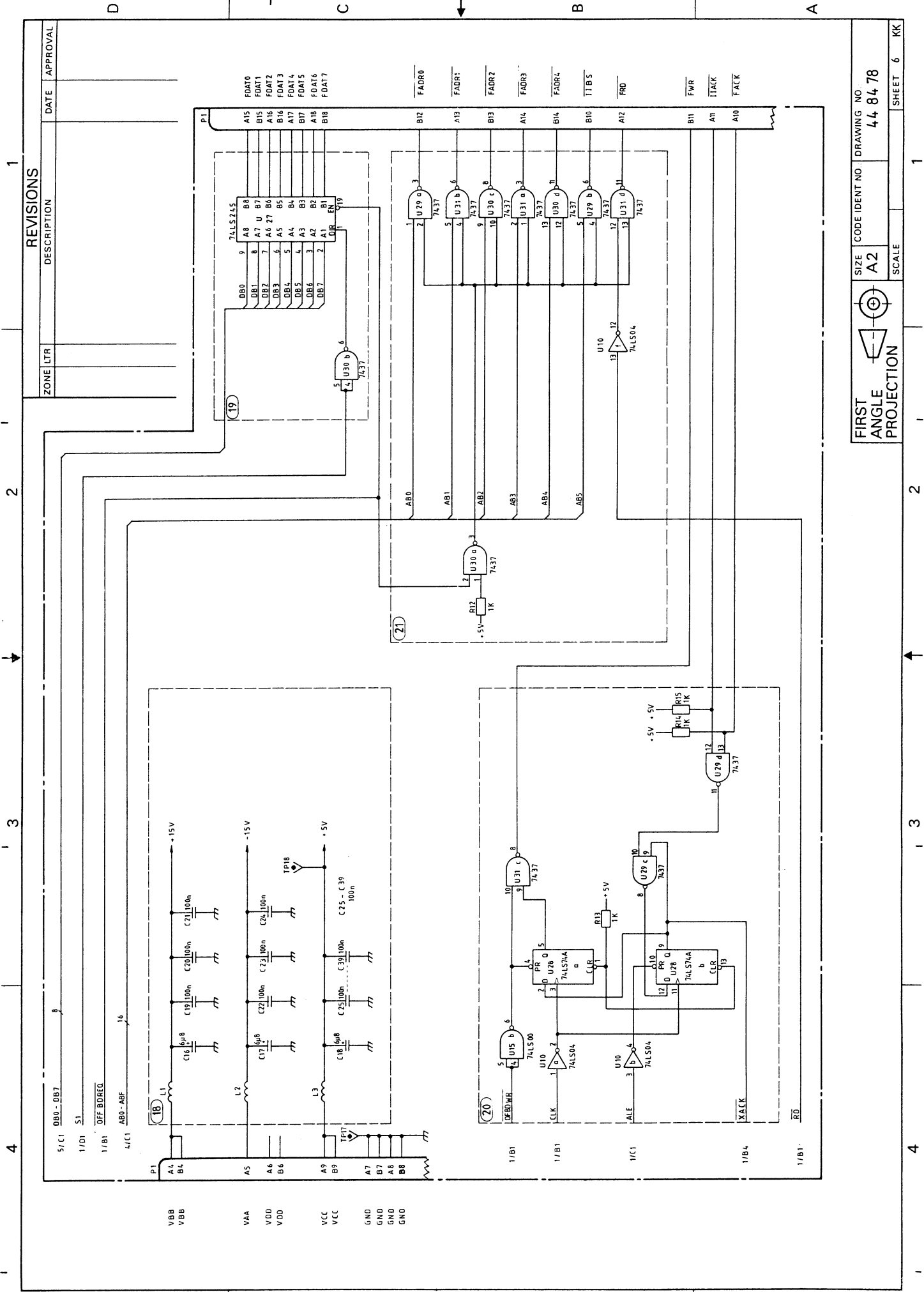
SIZE	CODE IDENT NO	DRAWING NO
A2		44 84 78
SCALE		SHEET 5
FIRST ANGLE PROJECTION		

- (22) RS232 interface for serial communication, optional.
- (23) Optocoupler interface to ensure electrical separation between incoming signals and on board signals.

External signal generators shall be 24V, 10mA to provide a proper TTL-signal on Q1's, Q2's or Q3's collector.

- (24) Diode network CR13 and CR14 are protection diodes. R34, CR12 ensures current through the connector when $\overline{PWR\overline{ON}}$ is low.

If power is removed by turning "Pwr off" on the front panel, $\overline{PWR\overline{ON}}$ goes high, and provides U50a in 13 to be cleared, by means of $\overline{COLD\overline{STRT}}$.



REVISIONS

ZONE LTR	DESCRIPTION	DATE	APPROVAL
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FIRST ANGLE PROJECTION

SIZE A2

CODE IDENT NO.

DRAWING NO. 44 84 78

SCALE

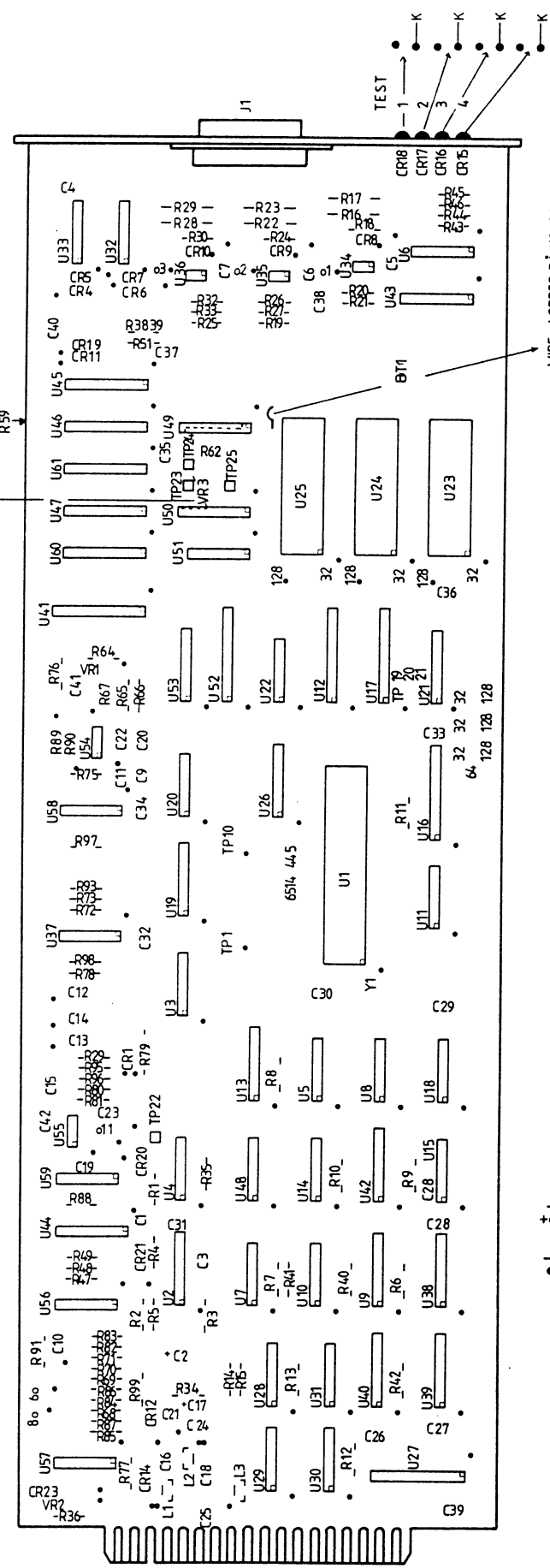
SHEET 6

KK

REVISIONS		
ZONE/LTR	DESCRIPTION	DATE APPROVAL
A	AM 84106 . REVISED	05.05.07 VH
B		24.2.90 VH
C		

VR3 LODDES PÅ BEN
4 PÅ U50

R67 MONTERES
PÅ LODDESIDE



WIRE . LODDES PÅ KOMPONENTSIDE
MEN DEN LIGGES PÅ LODDESIDE
MONTERES MED FLEX

Dansk Radio AS		TITLE	
DR		VH/75 1985	
CH			
AP			
AP			
FIRST ANGLE PROJECTION		COMPONENT LOCATION MICROCOMPUTER	
APPLICATION		SIZE CODE IDENT DRAWING NO	
NEXT ASSY USED ON		A2 44 84 78	
		SCALE 1:1	
		SHEET 1 OF 1	

(25) U52: Eight bit latch.

U53: Eight-bit Digital to Analog converter with associated resistor network.

U54: Operational amplifier with an output to be range set by R67. The maximum output may be adjusted to 10V.

(26) Circuit to provide an $\bar{A}T\bar{T}A\bar{C}\bar{K}$ as long as Q9 is open. To avoid spikes to cause an $\bar{A}T\bar{T}A\bar{C}\bar{K}$ R91, C10 determines the minimum time Q9 has to be open. R70, R71, C10 holds the $\bar{A}T\bar{T}A\bar{C}\bar{K}$ to ensure the microprocessor to read the $\bar{A}T\bar{T}A\bar{C}\bar{K}$.

(27) A $\bar{M}\bar{U}\bar{T}\bar{E}$ - Signal will force the AGC2 to +15V DC (maximum damping).

(28) U57: Analog switch. If closed then Automatic Gain Control is selected.

CR23 protects U57 against negative levels.

(29) Gain Control filter. When U58 (analog switch) is closed, the filter is set up for Single Side Band mode.

U55 is an operational amplifier used as a buffer.

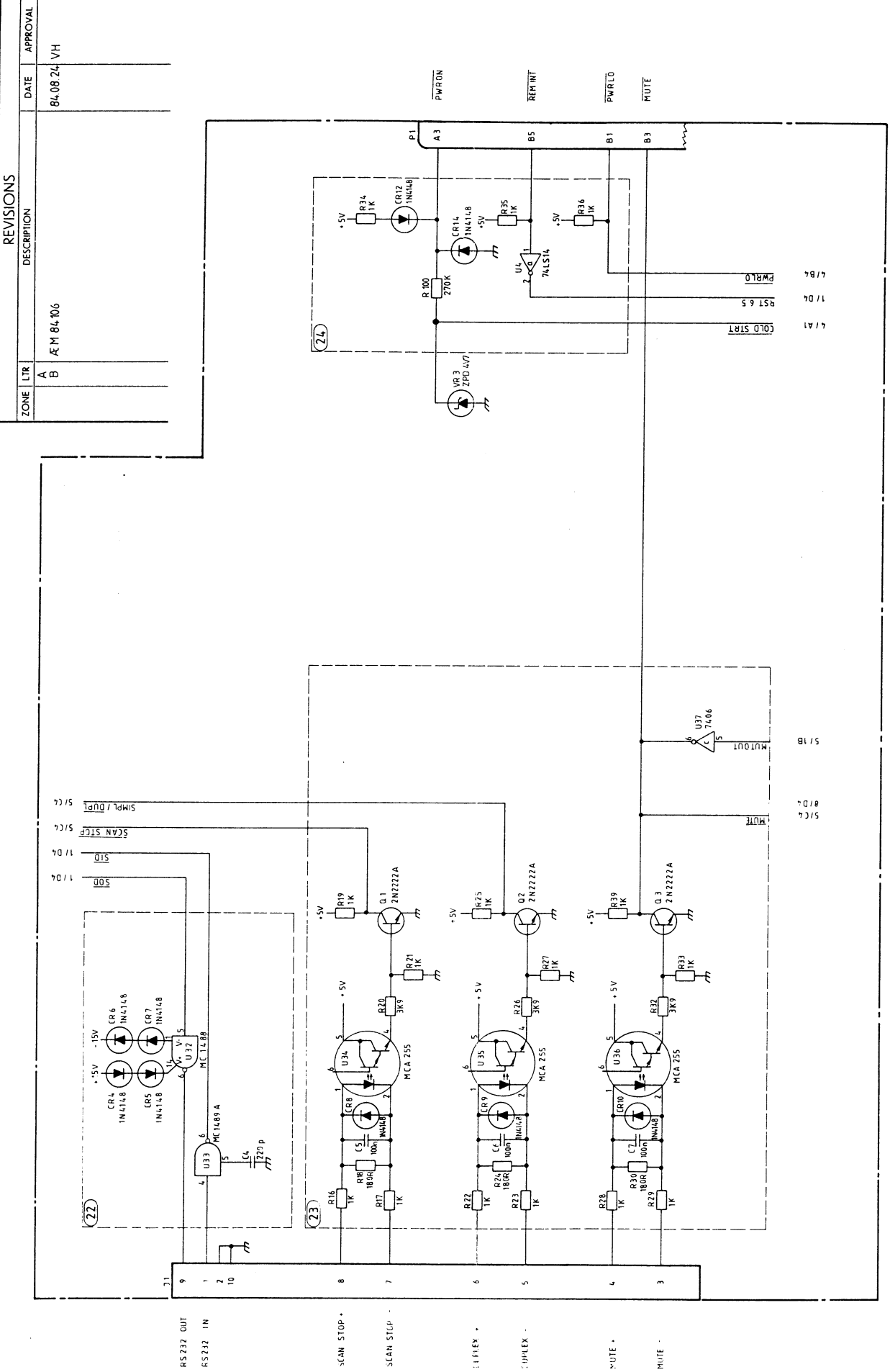
R82 protects U55 when muting.

(30) Sample hold circuit used to give a digital AGC-level to AGC 2. The microprocessor controls the hold and decay-level of the AGC2.

(31) By means of the comparator U59 and the D/A-converter in (25) an A/D-conversion of either AGC1, AGC2 or a test level can be performed.

(32) Sample hold circuit used to give a digital AGC-level to AGC1.

FIRST ANGLE PROJECTION		NO.: 44 84 78	SHEET 7	KK
SIZE	CLASS	SCALE:		
A 2				



ZONE	LTR	DESCRIPTION	DATE	APPROVAL
A		Æ M 84-106	84.08.24	VH
B				

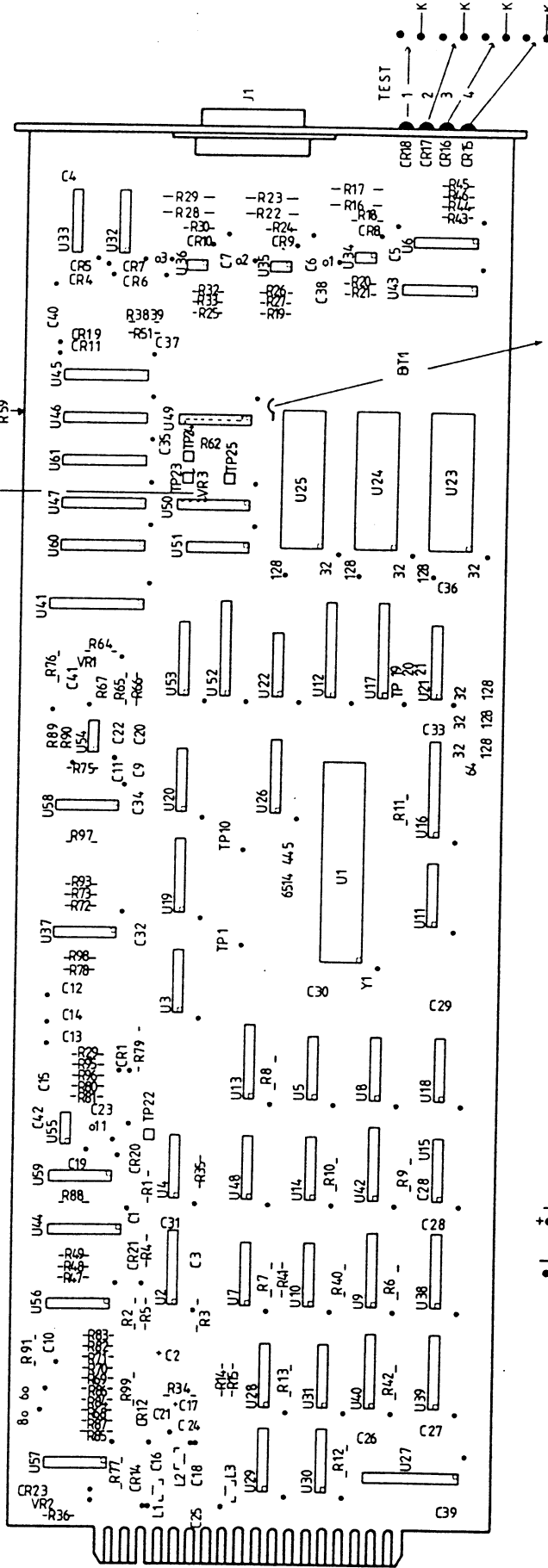
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
A		Æ M 84-106	84.08.24	VH
B				

REVISIONS

ZONE/LTR	DESCRIPTION	DATE	APPROVAL
A	AM 84.06 . REVISED	85.05.07 VH	
B		74.2.90 VH	
C			

VR3 LODDES PÅ BEN
4 PÅ U50

U49
R67 MONTERES
PÅ LODDSIDE

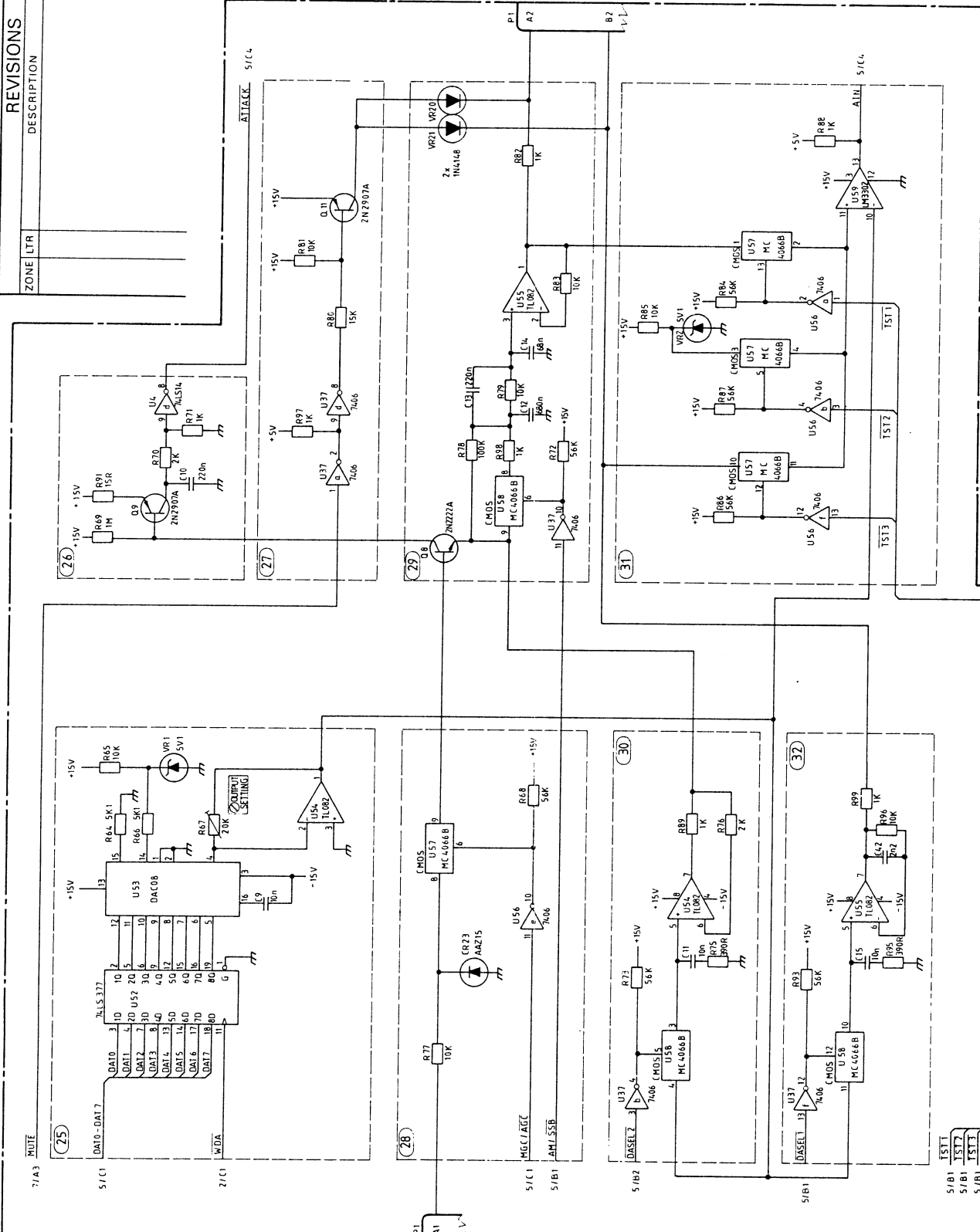


Dansk Radio AS		TITLE	
VH 75 1985		COMPONENT LOCATION	
DR		MICROCOMPUTER	
CH			
AP			
AP			
FIRST ANGLE PROJECTION		CODE IDENT DRAWING NO	
		44 84 78	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE IN ACCORDANCE WITH DS 2075		SIZE	
		A2	
		SCALE 1:1	
		SHEET 1 OF 1	

APPLICATION		ANGLES	
		LIN DIM	
		MATERIAL	
NEXT ASSY		USED ON	
471712		RX 4000	
457841		M 3000	
471909		RC 4000	

REVISIONS

ZONE LTR	DESCRIPTION	DATE	APPROVAL



7/A3	MUTE	74LS377	74LS147	74LS14	74LS148	74LS149	74LS150	74LS151	74LS152	74LS153	74LS154	74LS155	74LS156	74LS157	74LS158	74LS159	74LS160	74LS161	74LS162	74LS163	74LS164	74LS165	74LS166	74LS167	74LS168	74LS169	74LS170	74LS171	74LS172	74LS173	74LS174	74LS175	74LS176	74LS177	74LS178	74LS179	74LS180	74LS181	74LS182	74LS183	74LS184	74LS185	74LS186	74LS187	74LS188	74LS189	74LS190	74LS191	74LS192	74LS193	74LS194	74LS195	74LS196	74LS197	74LS198	74LS199	74LS200
------	------	---------	---------	--------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------

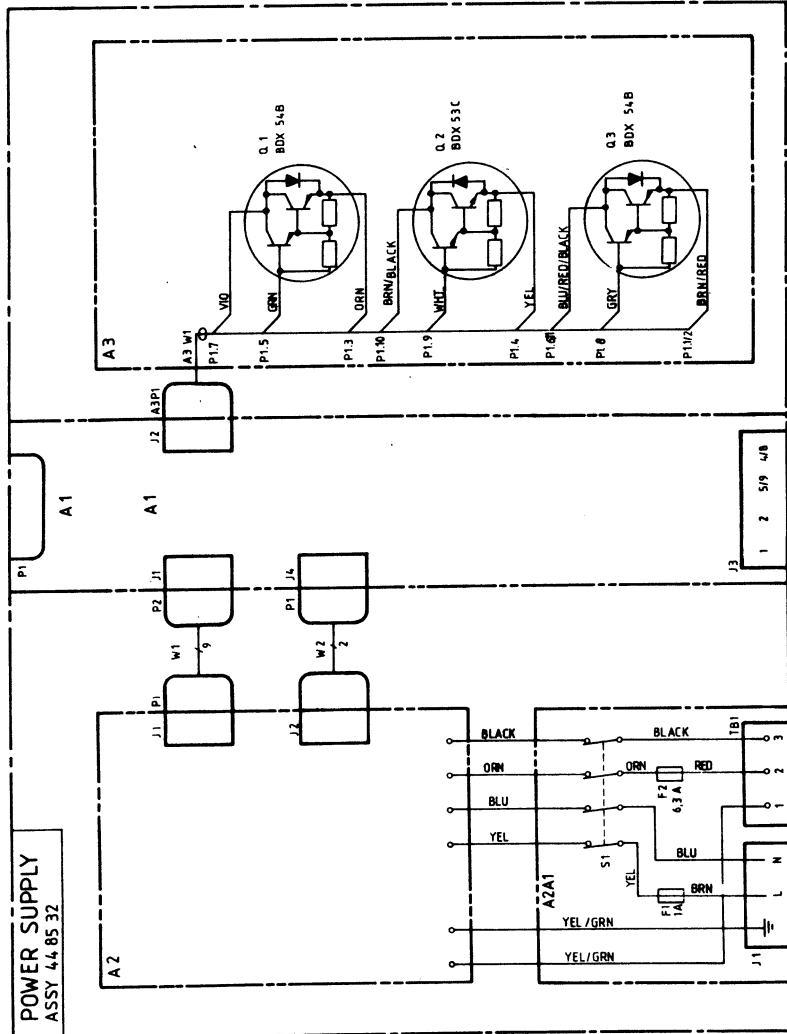
7/A3	MUTE	74LS377	74LS147	74LS14	74LS148	74LS149	74LS150	74LS151	74LS152	74LS153	74LS154	74LS155	74LS156	74LS157	74LS158	74LS159	74LS160	74LS161	74LS162	74LS163	74LS164	74LS165	74LS166	74LS167	74LS168	74LS169	74LS170	74LS171	74LS172	74LS173	74LS174	74LS175	74LS176	74LS177	74LS178	74LS179	74LS180	74LS181	74LS182	74LS183	74LS184	74LS185	74LS186	74LS187	74LS188	74LS189	74LS190	74LS191	74LS192	74LS193	74LS194	74LS195	74LS196	74LS197	74LS198	74LS199	74LS200
------	------	---------	---------	--------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------

7/A3	MUTE	74LS377	74LS147	74LS14	74LS148	74LS149	74LS150	74LS151	74LS152	74LS153	74LS154	74LS155	74LS156	74LS157	74LS158	74LS159	74LS160	74LS161	74LS162	74LS163	74LS164	74LS165	74LS166	74LS167	74LS168	74LS169	74LS170	74LS171	74LS172	74LS173	74LS174	74LS175	74LS176	74LS177	74LS178	74LS179	74LS180	74LS181	74LS182	74LS183	74LS184	74LS185	74LS186	74LS187	74LS188	74LS189	74LS190	74LS191	74LS192	74LS193	74LS194	74LS195	74LS196	74LS197	74LS198	74LS199	74LS200
------	------	---------	---------	--------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------

ASSY 448532, 448559, 448575, POWER SUPPLY ASSEMBLY

Service Sheet A10A1 and A10A2

REVISIONS		
ZONE	LTR	DATE
A		
BC 23 B	EM81067	810616GS
B4 C	ÆD9015	24.2.90 VH



4-w 4W LOUD SPEAKER
GND
SIDE TONE INPUT

±24VDC
AC MAINS

Dansk Radio AS		djia	
TITLE:		POWER SUPPLY	
DR: <i>McGowan</i>	80 0917	CH: 17	AP: 17
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES IN ACCORDANCE WITH DS 2075		FIRST ANGLE PROJECTION	
ANGLES:		MATERIAL:	
LIN. DIML:		APPLICATION	
45 78 41		M 3000	
NEXT ASSY		USED ON	
NO.:		44 85 32	
CLASS:		SCALE:	
SIZE A 2		SHEET 1 OF 1	

1. VEE Supply Filter2. -15V Reference Voltage Regulator

The reference voltage is adjusted to -15, 3V at 25°C by means of R19.

3. Standby/ON Switch Circuit

When P1-A3 is grounded, Q7 is switched on supplying +15V to 4.

4. U5

Forms part of the PWRL0 detector. R38 and R39 generate a reference ripple from the unregulated 8V. The reference ripple is compared with a threshold level (R42), holding Q17 in the off-state when the reference ripple exceeds the threshold level. Q8 and Q18 ensure a PWRL0 signal during start-up until VBB reaches VEE.

U5 generates in addition the 5V reference voltage for 5., 6. and 7.

5. VBB Regulator (+15V)

U2 compares VBB/3 with the 5V reference voltage and supplies the regulating current for the driving transistor Q2.

U1 forms the current limiting circuit. When the R10 voltage drop exceeds the R9 voltage drop, U1 shunts the regulating current for Q2 tracking a fold-back characteristic.

Q3, VR1 and R17 form a crow-bar protection on the regulator output voltage. The trigger point for Q3 is approx. +17V.

6. VAA Regulator (-15V)

U4c compares VAA with three times the 5V reference voltage and supplies the regulating current for the driving transistor Q5.

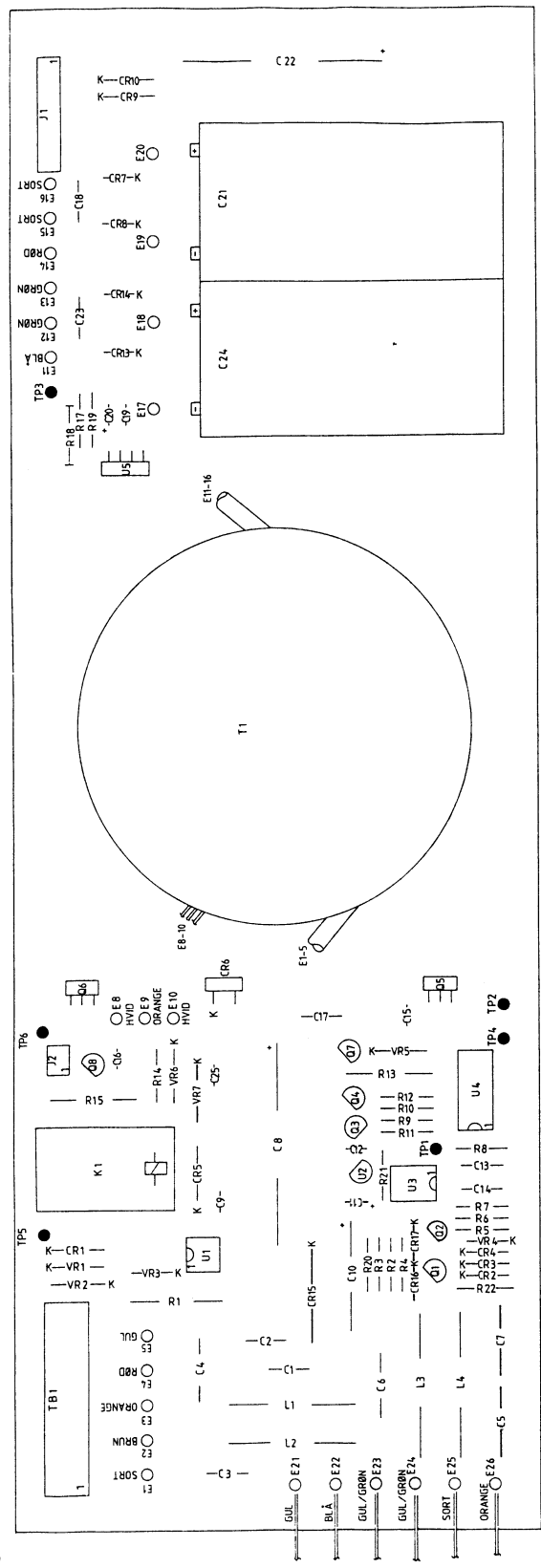
U4b forms the current limiting circuit similar in operation to 5. Q6, VR2 and R37 form a crow-bar protection on the regulator output voltage. The trigger point for Q6 is approx. -17V.

7. VCC/VDD Regulator (+5V)

U4d compares VDD from a motherboard sense point (P1-B6) or through R53, with the 5V reference voltage and supplies the regulating current for the driving transistor Q10.

U4a forms the current limiting circuit similar in operation to 5. Q11, VR4 and R63 form a crow-bar protection on the regulated output voltage. The trigger point for Q11 is approx. +6.2V.

ZONE	TR	DESCRIPTION	DATE	APPROVAL
C3	C	REVISED REVISED REVISED REVISED Added K on CR15	8/10/202 7/11/82 10/7/85 10/7/89 12/1/90	CS H NH WH/COUS
	D	AC0455		

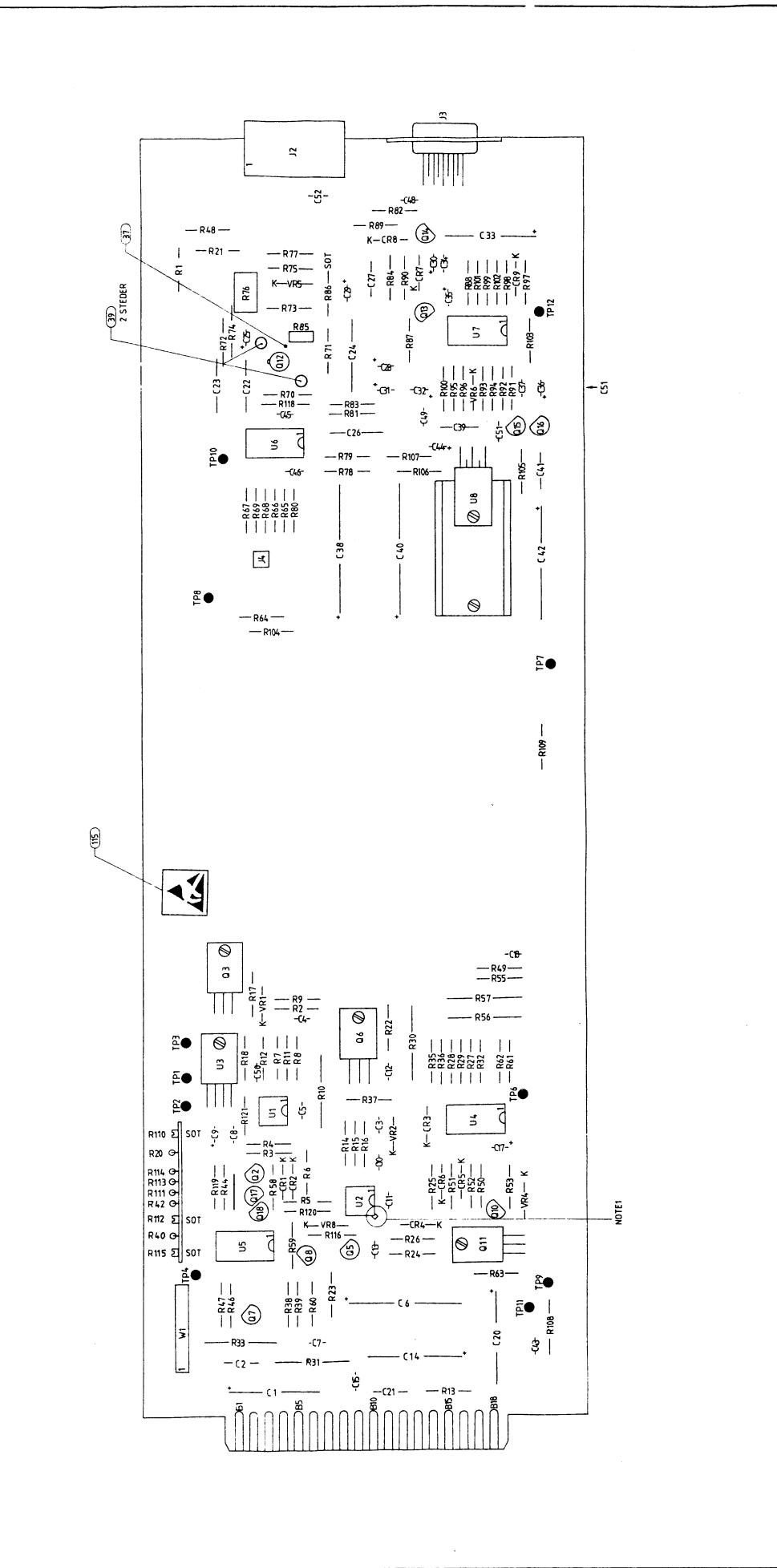


Dansk Radio AS		TITLE		POWER SUPPLY, 220V TRANSFORMER ASSY	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE AS SHOWN ACCORDANCE WITH IS 2075		DR 801125		CH	
AP		AP		AP	
FIRST ANGLE PROJECTION		SIZE		CODE IDENT DRAWING NO	
448532		M3000		448575	
NEXT ASSY USED ON		MATERIAL		SCALE 2:1	
APPLICATION		SHEET 1 OF 1		1	

REVISIONS		DATE	APPROVAL
NO.	DESCRIPTION		
1	1. HVIS U2 VIL BRUGS 1266, ER EN RUND IL SKAL DEN VENDE SOM VST.	12.11.96	M/GUS
2	2. W1 PIN9 INDRE BENI SKAL KLIPPES AF I BEGGE ENDER SÅ HJØRNERE BLIVER SKÅR	25.11.91	M/GUS

ZONELTR		DATE	APPROVAL
NO.	DESCRIPTION		
G	409471		
H	409531		

EIO BEKÆFTETELSE PÅ 1000
 CAUTION
 ZONES ARE SUBJECT TO DAMAGE BY STATIC ELECTRICITY



Dansk Radio AS		dja	
TITLE		POWER SUPPLY REGULATOR AND AF ASSY	
DR. B.D.	801014	SIZE	478559
CH. F.T.	22/11/96	CODE IDENT	DRAWING NO.
AP. DT.		ANGLE	A1
FIRST ANGLE PROJECTION		SCALE	
APPLICATION		SHEET 1 OF 1	

8. Notch Filter

U6a, U6b and U6c form an inverting voltage controlled bandpass filter with unity gain. The notch characteristic is obtained by adding the non-inverted input signal to the inverted output signal. Q12 acts as voltage controlled resistor in the filter. The filter is adjusted by means of R76 to 1 kHz notch tune when TP9 is set to -11.5V.

9. Notch Control

R84, R85 and C29 filter and temperature stabilize the filter control voltage.

By means of Q13 and Q14 the notch filter may be bypassed. When TP9 reaches -15V, Q13 is switched on whereby the bandpass filter output is grounded.

U6d forms a summing amplifier for AFDET, bandpass filter output and "Side-Tone" input.

10. AF-Gain Control

The AF signal from (9) is routed to U7-11. The control voltage between U7-6 and U7-9 adjusts the AF signal level at R103 by means of the emitter coupled amplifier within U7. The control voltage is derived from the AF gain control adjustment. The overall gain of the stage may be controlled from -60 dB to approx. 0 dB.

11. AF Output Amplifier

U8 forms the AF output amplifier. The stage has a voltage gain of approx. 38 dB and is capable of delivering up to 4W in a 4 ohm load.

- 1 HVUS UD VIT BRØLSTIK ER EN
RUND IC, SKAL DEN VENDE SOM VIST
- 2 VIT PIN9 INDIRE BENI SKAL KLIPPES AF
I BEGGE ENDER SÅ HJERNEN BLIVER SKRA

ESD BESITTELSE PER

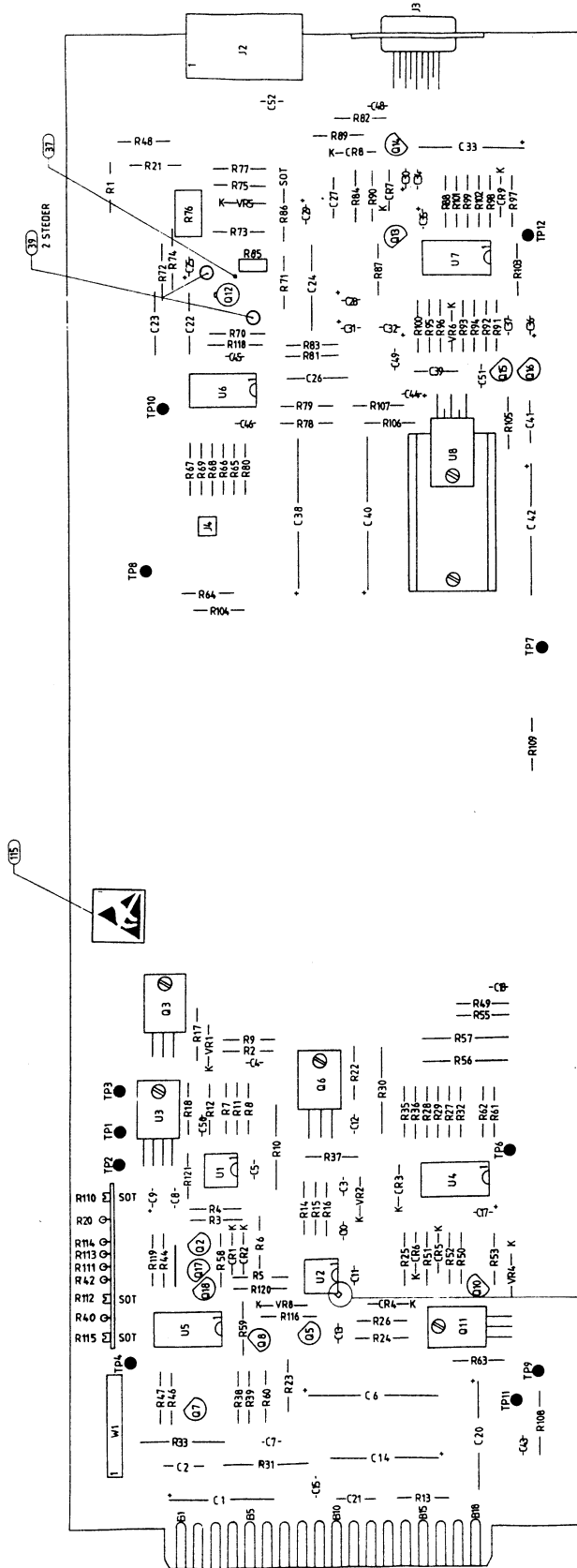
CAUTION

DEVICES ARE SUBJECT
TO ESD DAMAGE

REVISIONS

DATE	APPROVAL
12.11.96	M/GUS
25.11.91	M/GUS

ZONELTR	DESCRIPTION
G	£09471
H	£09531



NOTE1

Dansk Radio AS		dta	
TITLE		POWER SUPPLY REGULATOR AND AF ASSY	
DR. B.D.	80.10.14	CH	11.2
AP	11.2	AP	11.2
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS AND DECIMALS ARE IN INCHES UNLESS OTHERWISE SPECIFIED		FIRST ANGLE PROJECTION	
L7.40.29		SIZE	
L4.85.32		CODE IDENT	
M3000		DRAWING NO	
USED ON		448559	
APPLICATION		SCALE	
		SHEET 1 OF 1	

1. EMI Filter for AC Mains Supply

2. AC-mains sensor.

3. EMI Filter for 24Vdc supply

4. DC/AC switch circuit.

When the AC mains is available U1 will discharge C10 during each positive half cycle.

When AC mains is removed C10 will be discharged through R3.

By means of Q1 the relay K1 will be energized whereby the mains transformer will be disconnected from mains, Q2 starts to conduct and 5., 6. and 7. receives supply voltage.

When the AC mains is restored C10 will be discharged, the relay K1 will be deenergized and 5., 6. and 7. return to the stand-by state.

5. +5V regulator for inverter control

6. 170 Hz oscillator

7. U4

forms a flip-flop alternating the "on" state of Q3 respectively Q4. The output cycle frequency is 85 Hz.

8. Push-pull transistors Q5 and Q6

alternate the current through the tertiary winding of the mains transformer. Q7 and Q8 acts as current limiters and VR5 and VR6 as voltage limiters.

9. Mains Transformer

with 110V/220V straps.

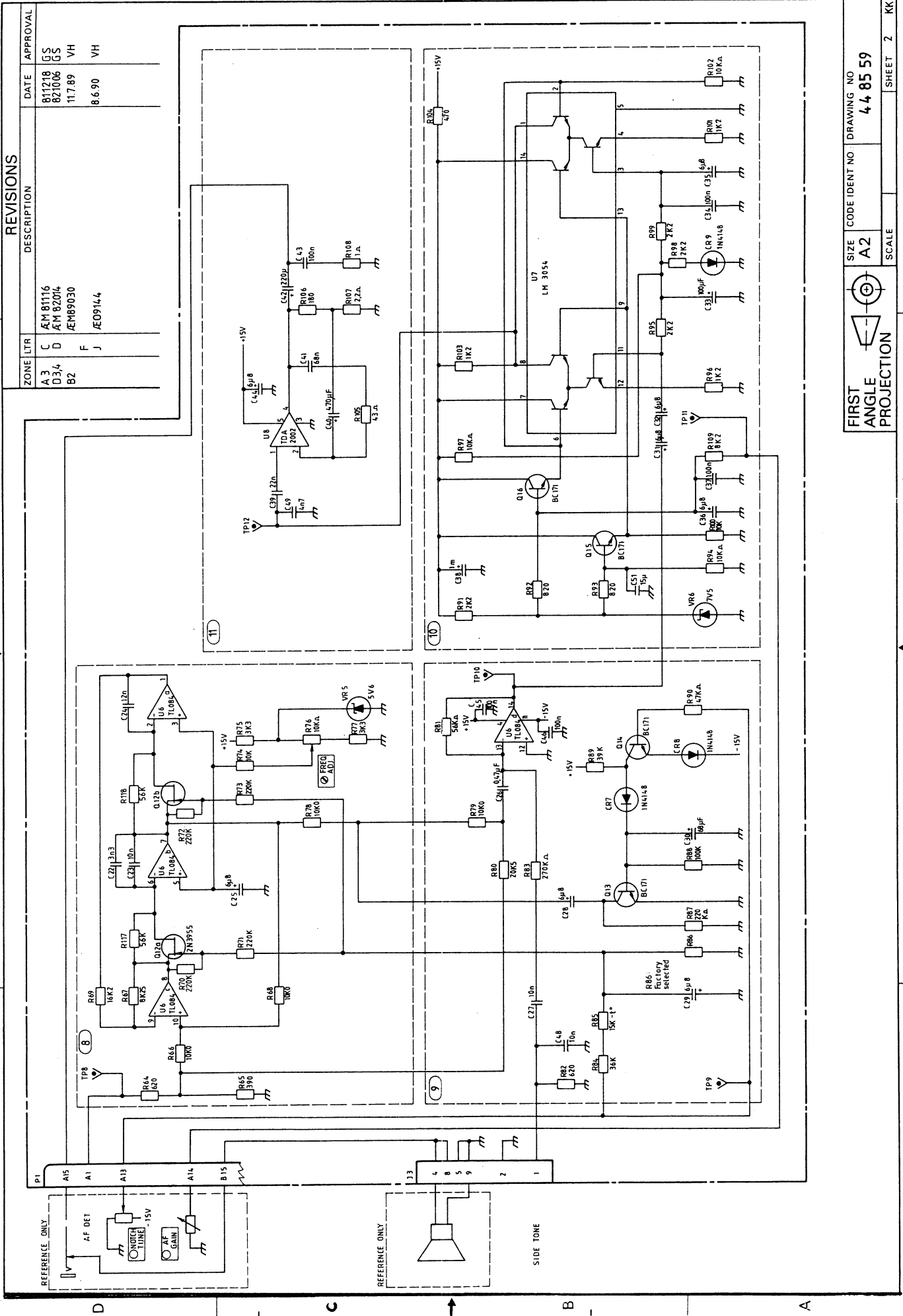
For 110V supply, strap 1-2, 3-4, 5-6

For 220V supply, strap 2-3

10. Rectifiers and Filters

11. +15V Regulator for Standby Supply

By means of R18 the voltage is adjusted to +15.3V at 25°C.



ASSY 477958, 448613, FRONT PANEL CIRCUIT

Service Sheet All

ASSY 477958, FRONT PANEL CIRCUIT Schematic 1

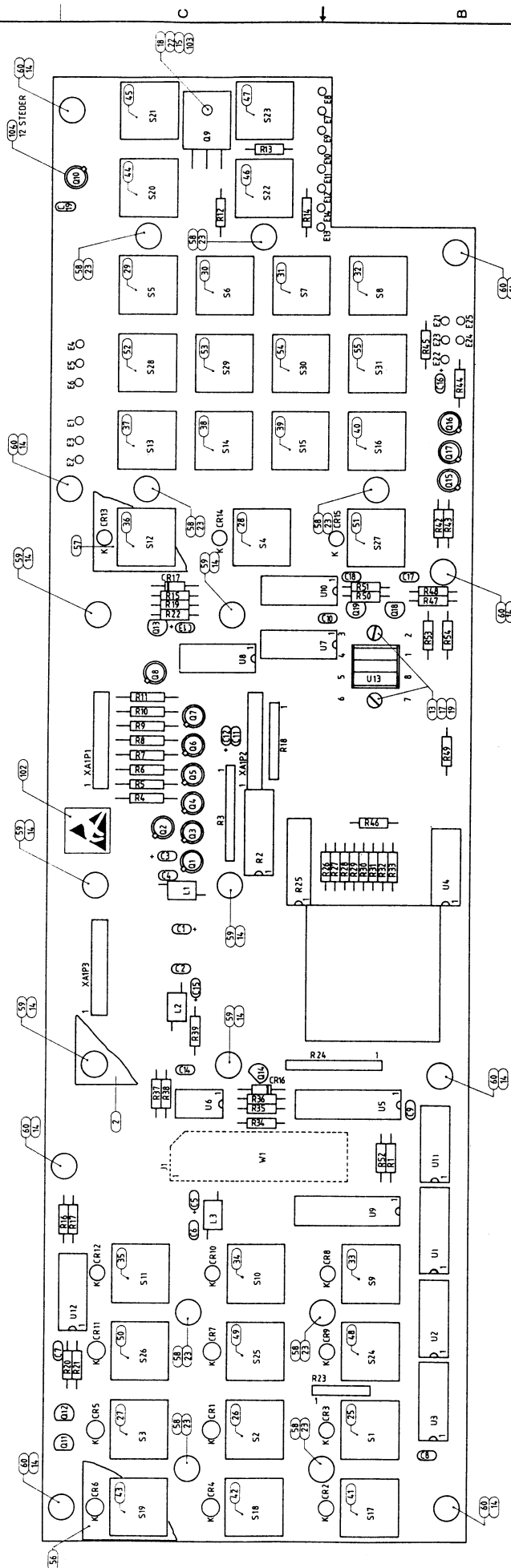
- ① Address decoding with associated gates for generation of acknowledge $\bar{F}\bar{A}\bar{C}\bar{K}$, as handshaking signal for the microcomputer.
- ② Supply filters.

REVISIONS		DATE	APPROVAL
ZONE	TR	DESCRIPTION	
A		REVISÉ	FP
C		AN 85171	22.5.85
D		AN 85171	17.12.87
E		AN 85171	16.191
F		AN 85171	VH/
G		AN 85171	VH/403

- 1 ALLE SKOVINDER MIDT PINT
MONTERES MED FLANSKE (L)
- 2 ALLE LYSINDER MONTERES
MED (31) LÆNGDE 2,1m
- 3 DE 4 MIDTEREN PÅ U3 MONTERES
MED (21) LÆNGDE 9mm

ESD BEHÆTTELSE PÅ (20)

CAUTION
ELECTROSTATIC DISCHARGE
TO DAMAGE BY
STATIC ELECTRICITY



Dansk Radio AS		J10	
TITLE		FRONT PANEL CIRCUIT	
DR	FP	SIZE	CODE IDENT
CH		ANGLE	DRAWING NO
AP		PROJECTION	47 79 58
FIRST ANGLE		SCALE	
MATERIAL		SHEET 1 OF 1	
APPLICATION			
NEXT ASSY			
USED ON			

③ Eight-bit latch used for segment information to displays and LED's, and data to D/A-converter ⑪ .


④ Q1-Q8: Drivers for segment information.
R4-R11: Current limiting resistors.

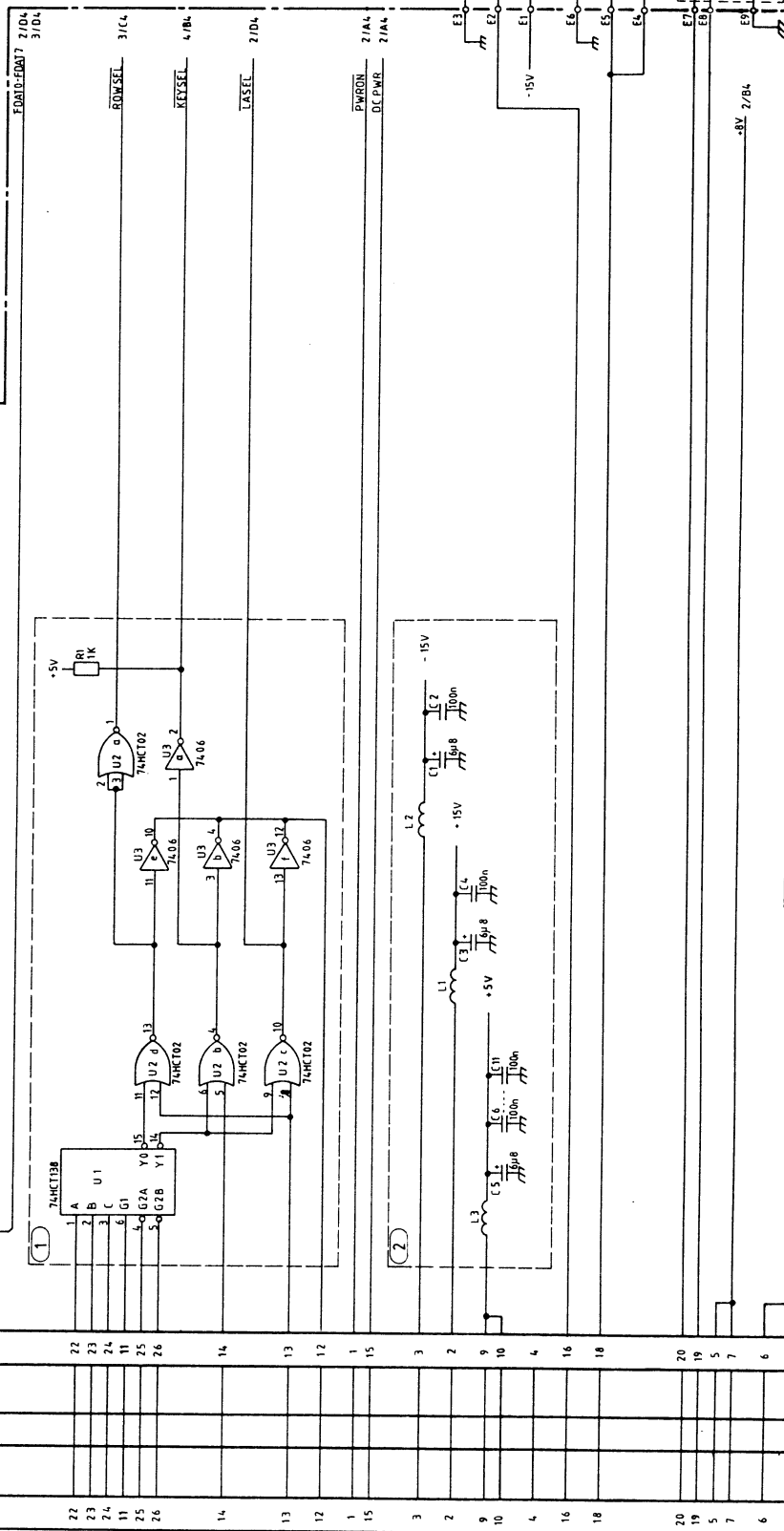
⑤ LED indicators.


CR no. Corresponding switch

1	inter
2	off
3	slow
4	WIDE
5	AM
6	SSB
7	narr
8	att
9	fast
10	vnar
11	RTTY
12	CW
13	tune
14	bfo
15	scan

⑥ Dimmer circuit, controls the light in displays, LED's and S-meter.

REVISIONS				DATE	APPROVAL
ZONE	LTR	DESCRIPTION			
	A	REVISED		81.02.02	
5 B3	C	ÆM81050		810514 GS	
1 B1	C1	ÆM81064	}	810526 GS	
5 B3	C1	ÆM81065			
5 B2	C2	ÆM81134		811221 GS	
	D	ÆM81152		810432 FP	
1A1	E	ÆM84119		850319	VH
	F	ÆM81058		871008	VH
	G	ÆM8057-88075		9.12.88	VH



				Dansk Radio AS		dra	
				TITLE: FRONT PANEL CIRCUIT			
		DR: <i>Widener</i>		80 10 06			
		CH: F B		80 10 16			
		AP:					
		AP:					
							
						FIRST ANGLE PROJECTION	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLI- METRES AND TOLERANCES IN ACCORDANCE WITH DS 2075							
ANGLES:							
LIN. DIM:							
MATERIAL:							
4.5 78 25		M 3000					
NEXT ASSY		USED ON					
				APPLICATION			
				SIZE: A 2		CLASS: NO.:	
				47 79 58			
				SCALE:		SHEET 1 OF 5	

- ⑦ U7, U8: Shift registers with associated pull-up network, used for multiplexing displays LED's and switches. It also selects the sample hold circuit ⑬, and clears tune F/F ⑫. R15, C13 clears U7 - U8 during start-up.
- ⑧ Drivers for multiplexing of LED's.

1
2
3
4



U

8

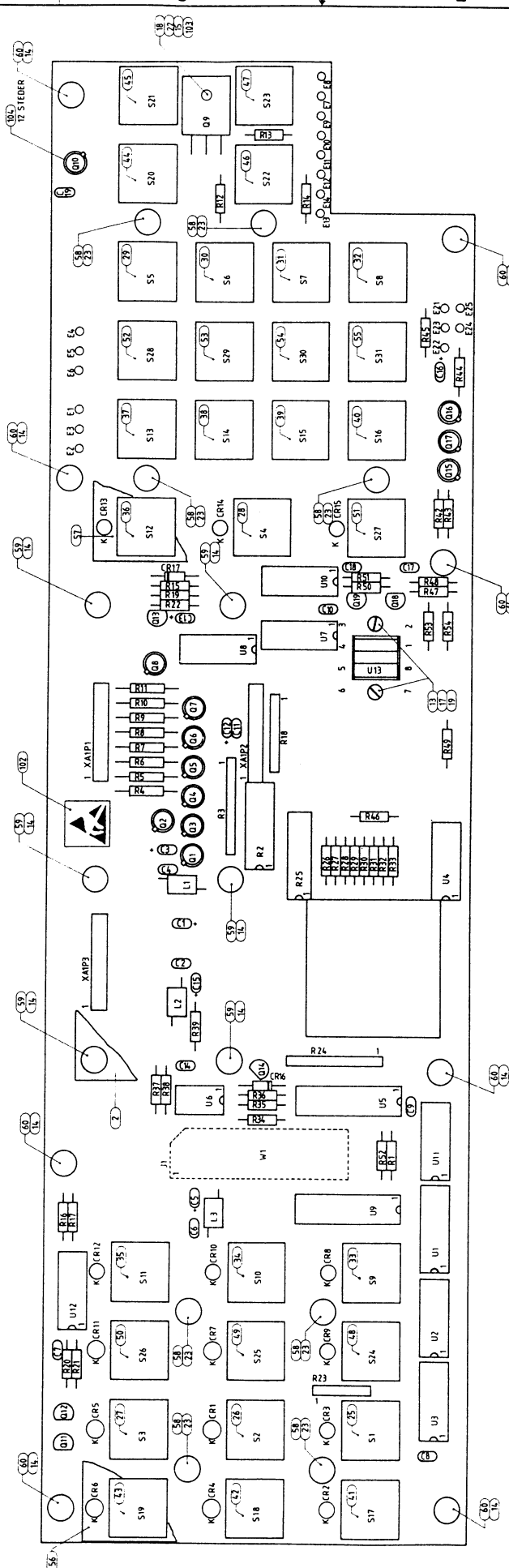
A

[illegible]

- 1 ALLE SKRUEHØVETER MOD PRINT
- 2 MONTERE KOMPONENTER (16)
- 3 MONTERE KOMPONENTER
- 4 MED 21 LÆNGDE 2 km
- 5 DE 4 HØJTEREN PÅ U3 MONTERES
- 6 MED 21 LÆNGDE 9mm
- 7 ESD BEHÅNDET SE PER

CAUTION
 DO NOT TOUCH THE SUBJECT
 TO DAMAGE BY
 STATIC ELECTRICITY

REVISIONS		DATE	APPROVAL
1	REVISED	16.03.2017	PP
2	REVISED	27.05.2017	PP
3	REVISED	17.12.2017	PP
4	REVISED	16.11.2017	PP
5	REVISED	17.12.2017	PP
6	REVISED	16.11.2017	PP
7	REVISED	17.12.2017	PP
8	REVISED	16.11.2017	PP
9	REVISED	17.12.2017	PP
10	REVISED	16.11.2017	PP
11	REVISED	17.12.2017	PP
12	REVISED	16.11.2017	PP
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19	REVISED	17.12.2017	PP
20	REVISED	16.11.2017	PP
21	REVISED	17.12.2017	PP
22	REVISED	16.11.2017	PP
23	REVISED	17.12.2017	PP
24	REVISED	16.11.2017	PP
25	REVISED	17.12.2017	PP
26	REVISED	16.11.2017	PP
27	REVISED	17.12.2017	PP
28	REVISED	16.11.2017	PP
29	REVISED	17.12.2017	PP
30	REVISED	16.11.2017	PP
31	REVISED	17.12.2017	PP
32	REVISED	16.11.2017	PP
33	REVISED	17.12.2017	PP
34	REVISED	16.11.2017	PP
35	REVISED	17.12.2017	PP
36	REVISED	16.11.2017	PP
37	REVISED	17.12.2017	PP
38	REVISED	16.11.2017	PP
39	REVISED	17.12.2017	PP
40	REVISED	16.11.2017	PP
41	REVISED	17.12.2017	PP
42	REVISED	16.11.2017	PP
43	REVISED	17.12.2017	PP
44	REVISED	16.11.2017	PP
45	REVISED	17.12.2017	PP
46	REVISED	16.11.2017	PP
47	REVISED	17.12.2017	PP
48	REVISED	16.11.2017	PP
49	REVISED	17.12.2017	PP
50	REVISED	16.11.2017	PP
51	REVISED	17.12.2017	PP
52	REVISED	16.11.2017	PP
53	REVISED	17.12.2017	PP
54	REVISED	16.11.2017	PP
55	REVISED	17.12.2017	PP
56	REVISED	16.11.2017	PP
57	REVISED	17.12.2017	PP
58	REVISED	16.11.2017	PP
59	REVISED	17.12.2017	PP
60	REVISED	16.11.2017	PP
61	REVISED	17.12.2017	PP
62	REVISED	16.11.2017	PP
63	REVISED	17.12.2017	PP
64	REVISED	16.11.2017	PP
65	REVISED	17.12.2017	PP
66	REVISED	16.11.2017	PP
67	REVISED	17.12.2017	PP
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73	REVISED	17.12.2017	PP
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76	REVISED	16.11.2017	PP
77	REVISED	17.12.2017	PP
78	REVISED	16.11.2017	PP
79	REVISED	17.12.2017	PP
80	REVISED	16.11.2017	PP
81	REVISED	17.12.2017	PP
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94	REVISED	16.11.2017	PP
95	REVISED	17.12.2017	PP
96	REVISED	16.11.2017	PP
97	REVISED	17.12.2017	PP
98	REVISED	16.11.2017	PP
99	REVISED	17.12.2017	PP
100	REVISED	16.11.2017	PP



Danek Radio AS		Title	
DR	FP	B30311	
CH	CH		
AP	AP		
FIRST ANGLE PROJECTION		CODE IDENT DRAWING NO	
45° 75°		A1	
NEXT ASSY USED ON		SIZE	
		47 79 58	
APPLICATION		SCALE	
		1	
		SHEET 1 OF 1	

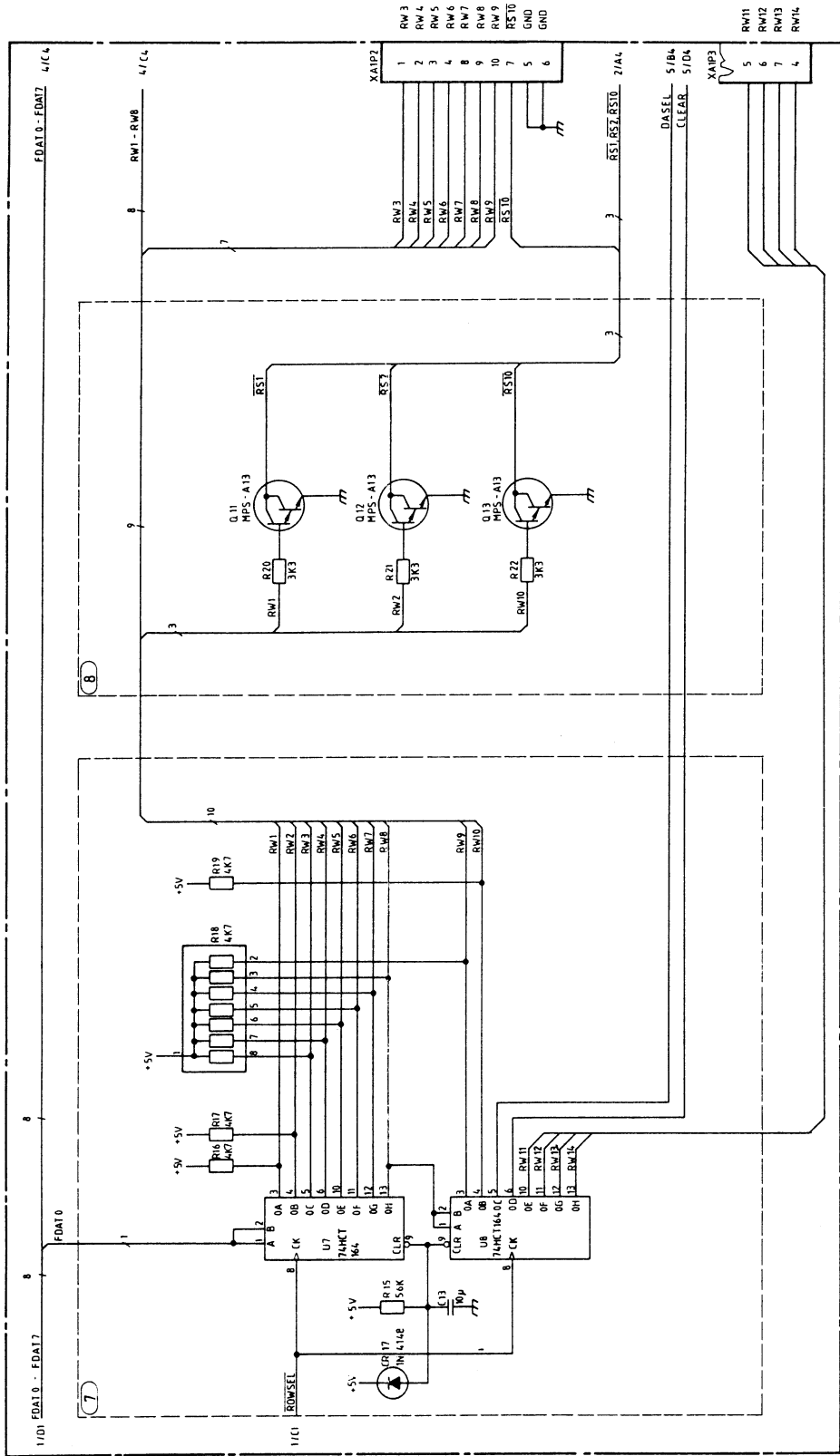
Danek Radio AS		Title	
DR	FP	B30311	
CH	CH		
AP	AP		
FIRST ANGLE PROJECTION		CODE IDENT DRAWING NO	
45° 75°		A1	
NEXT ASSY USED ON		SIZE	
		47 79 58	
APPLICATION		SCALE	
		1	
		SHEET 1 OF 1	

ASSY 477958, FRONT PANEL CIRCUIT Schematic 4

- (9) Eight-bit output buffer, read
by the microcomputer,
- (10) S1-S31, switches SPSTNO (Sing-
le Pole Single Throw Normally
Open) with associated pull-
up network and open-collector
buffers.

1 2 3 4

REVISIONS		
ZONE LTR	DESCRIPTION	DATE APPROVAL
B	REVISED	81.02.02
C	MEM87058	87.10.08
D	REVISED	87.10.22
E	REVISED	88.04.22
		VH
		VH



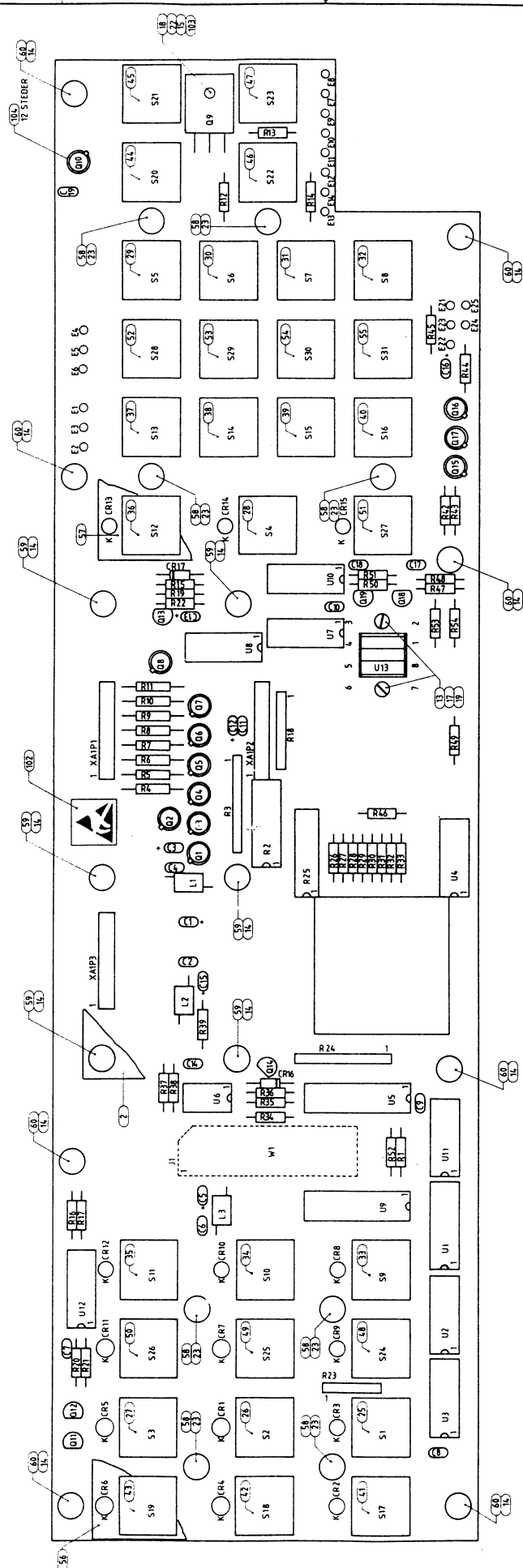
FIRST ANGLE PROJECTION	SIZE A2	CODE IDENT NO	DRAWING NO
			47 79 58
	SCALE	SHEET 3	KK

1 2 3 4

- 1 ALLE SKRIBEHOJDER MØD-PRINT
MONTERES MED ELASTISKE (16)
2 ALLE LYSODDER MONTERES
MED (21) LÆNGDE 2,1m
3 DE + MODTEREN PÅ U13 MONTERES
MED (21) LÆNGDE 9mm
EIO BEHÆFTETILSÆR RPR (40)
CAUTION
DESIGNS ARE SUBJECT
TO DAMAGE BY
STATIC ELECTRICITY

ZONE	TR	DESCRIPTION	DATE	APPROVAL
A	REVISED		14.04.12	FP
B	REVISED		22.05.05	WH
C	REVISED		16.07.07	WH
D	REVISED		16.07.07	WH
E	REVISED		16.07.07	WH
F	REVISED		16.07.07	WH
G	REVISED		17.01.91	WH/CLUS

REVISIONS



Dansk Radio AS		TITLE	
DR	FP	830311	
CH			
AP			
FIRST ANGLE PROJECTION		SIZE	CODE IDENT
		A1	DRAWING NO
		47 79 58	
APPLICATION		SCALE	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED			
ANGLES LIN DIM.			
MATERIAL			
LS 78 25 H 3000			
NEXT ASSY USED ON			

FRONT PANEL CIRCUIT

- ⑪ Eight-bit Digital to Analog converter.

R24: pull-up network

R25-R33: R-2R network

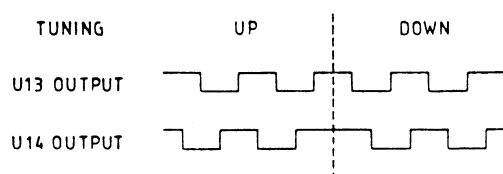
U6b: Operational amplifier with an output range from 5V to 10V.

- ⑫ Input-circuit for inreading of tune adjustment.

U11a: is set when tuning

U11b: is set when tuning up

When U11 has been read by the microcomputer, the program will clear U11a.



- ⑬ Sample hold circuit used as a source generator to the S-meter ⑭ and for A/D-conversion ⑮ .

- ⑭ S-meter with associated lamps.

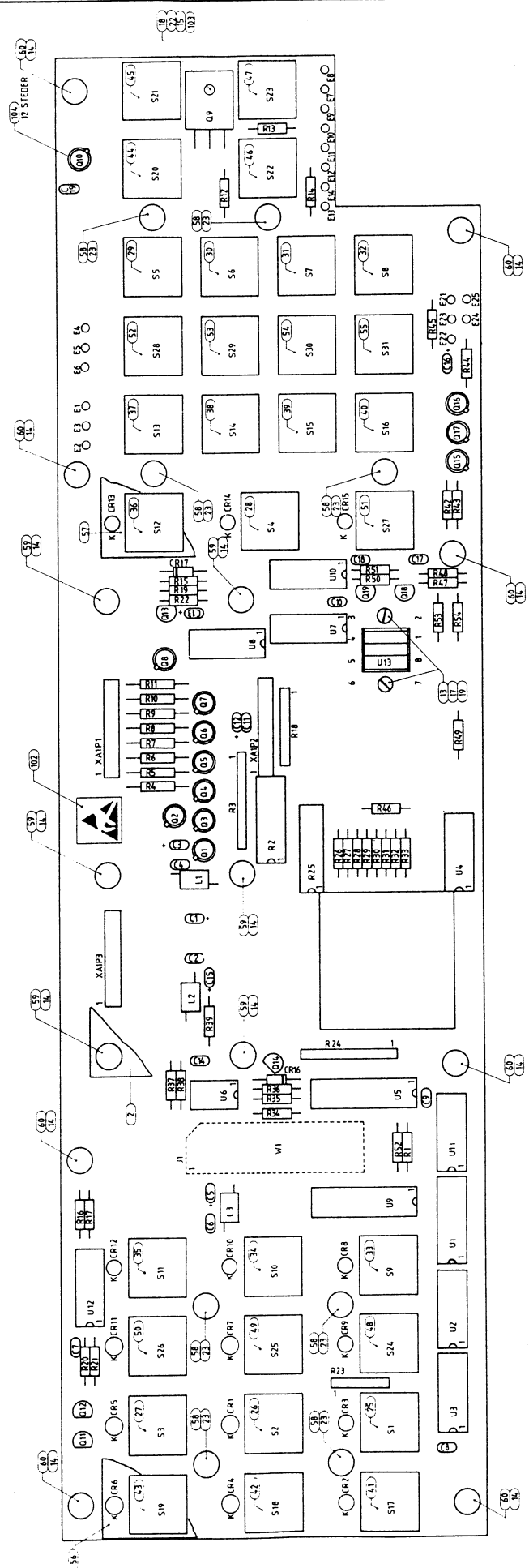
- ⑮ Voltage comparator.

By means of the D/A-converter ⑪ and the comparator circuit an A/D-conversion of the RF-level is performed.

REVISIONS		
ZONE	DESCRIPTION	DATE
A	REVISED	14.04.12
B	REVISOR	17.02.07
C	REVISOR	17.02.07
D	REVISOR	17.02.07
E	REVISOR	17.02.07
F	REVISOR	17.02.07
G	REVISOR	17.02.07

ZONE	DESCRIPTION	DATE	APPROVAL
A	REVISED	14.04.12	PP
B	REVISOR	17.02.07	WH
C	REVISOR	17.02.07	WH
D	REVISOR	17.02.07	WH
E	REVISOR	17.02.07	WH
F	REVISOR	17.02.07	WH
G	REVISOR	17.02.07	WH

1 ALLE SKRIVEHØJDER MØD PRINT
MONTERES MED FLADSKIVE (16)
2 ALLE LYSODDER MONTERES
MED (32) LANGE 2.5mm
3 DE 3 HØJDER PÅ U13 MONTERES
MED (32) LANGE 2.5mm
ESD BEHAGTELSE PER (16)
CAUTION
DEVICES ARE SUBJECT
TO ESD DAMAGE
STATIC ELECTRICITY



Danek Radio AS		DRA	
TITLE		FRONT PANEL CIRCUIT	
DR	PP 830311	CH	---
AP	---	AP	---
UNLESS OTHERWISE SPECIFIED DIMENSIONS AND TOLERANCES ARE IN ACCORDANCE WITH DG 2015		FIRST ANGLE PROJECTION	
ANGLES	LIN DIM	MATERIAL	---
LS 75	M 3000	USED ON	---
NEXT ASSY	---	APPLICATION	---
SIZE	CODE IDENT	DRAWING NO	47 79 58
A1	SCALE	SHEET 1 OF 1	---

ASSY 448613, DISPLAY BOARD ASSEMBLY

U1-U7 7-segment display.
Most significant digit, U1.

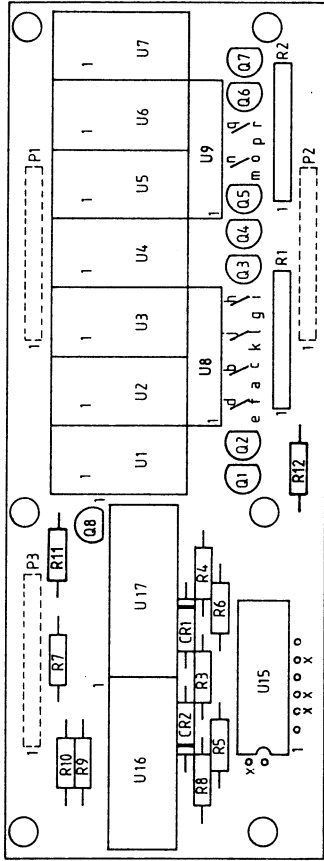
U8, U9 Light bars.

Q1-Q8 Drivers for multiplexing.

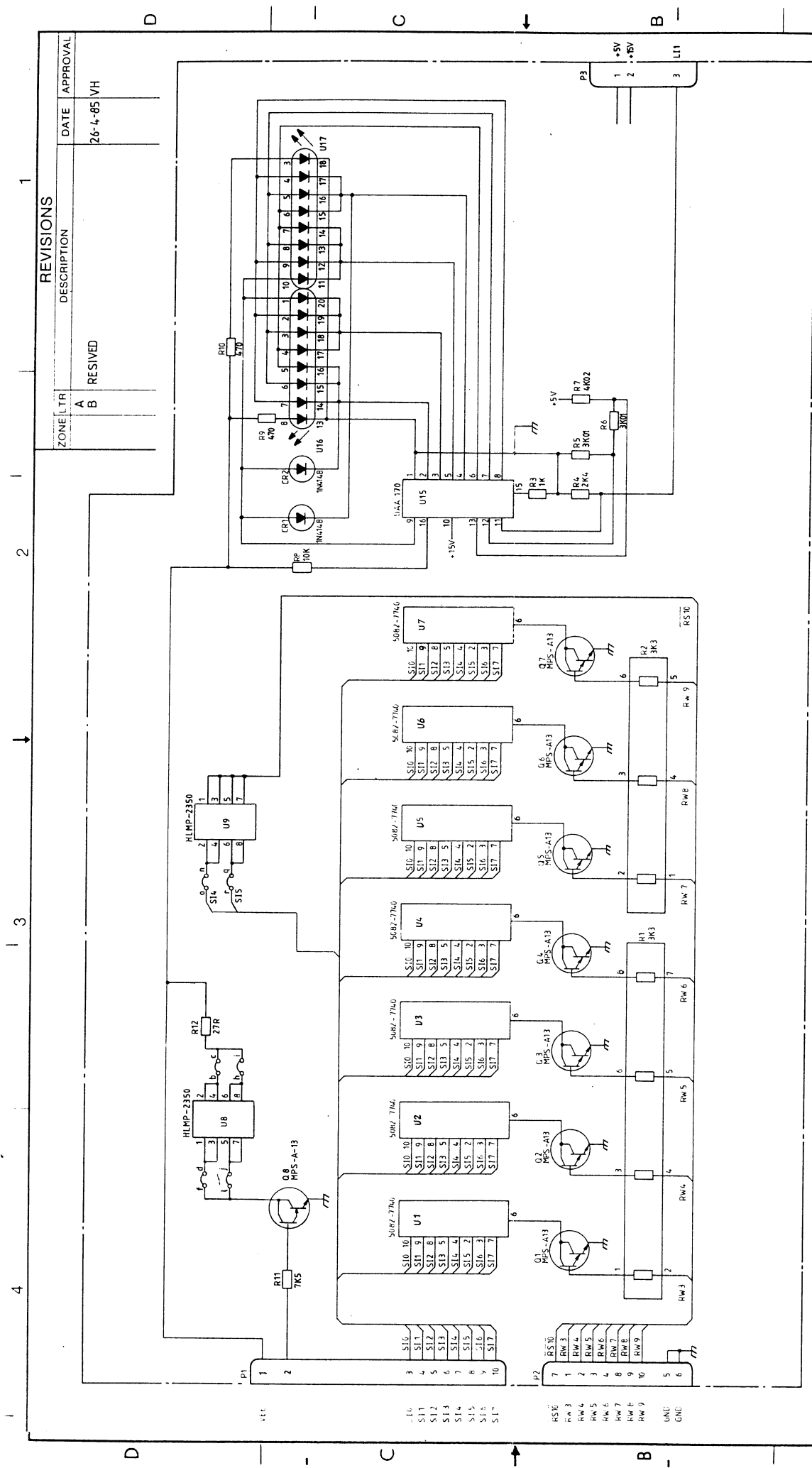
1. ØER MÆRKET MED X FJERNES PÅ C-SIDE AF
PWB
NOTE: U16-U17 SKAL HAVE SAMME BOGSTAVKODE
U1-U7 SKAL HAVE SAMME BOGSTAVKODE
U8-U9 SKAL HAVE SAMME BOGSTAVKODE

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVAL
38	A	Hulmarkering indført.	1.11.1984	VH
	B		4.3.90	
	C			



Dansk Radio AS		TITLE	
DISPLAY BOARD		DRAWING NO.	
SIZE		DRAWING NO.	
A 2		44 86 13	
SCALE		SHEET 1 OF	
FIRST ANGLE PROJECTION		DRAWING NO.	
M3000		44 86 13	
USED ON		DRAWING NO.	
APPLICATION		DRAWING NO.	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075		DRAWING NO.	
ANGLES		DRAWING NO.	
LIN. DIM.		DRAWING NO.	
MATERIAL		DRAWING NO.	
44.8591		DRAWING NO.	
NEXT ASSY		DRAWING NO.	
APPLICATION		DRAWING NO.	



Dansk Radio AS		TITLE		DRAWING NO.		SHEET 1 OF 1	
DISPLAY BOARD		17-6-83		44 86 13			
DR		FP		A 2		SCALE	
CH		AP		FIRST ANGLE PROJECTION		CODE IDENT	
AP		M3000		APPLICATION		SIZE	
44 85 91		NE		1-5-83		DRAWING NO.	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS AND TOLERANCES ARE IN ACCORDANCE WITH DS 2025		ANGLES: LIN DIM		MATERIAL		SIZE	
						SCALE	
						SHEET 1 OF 1	

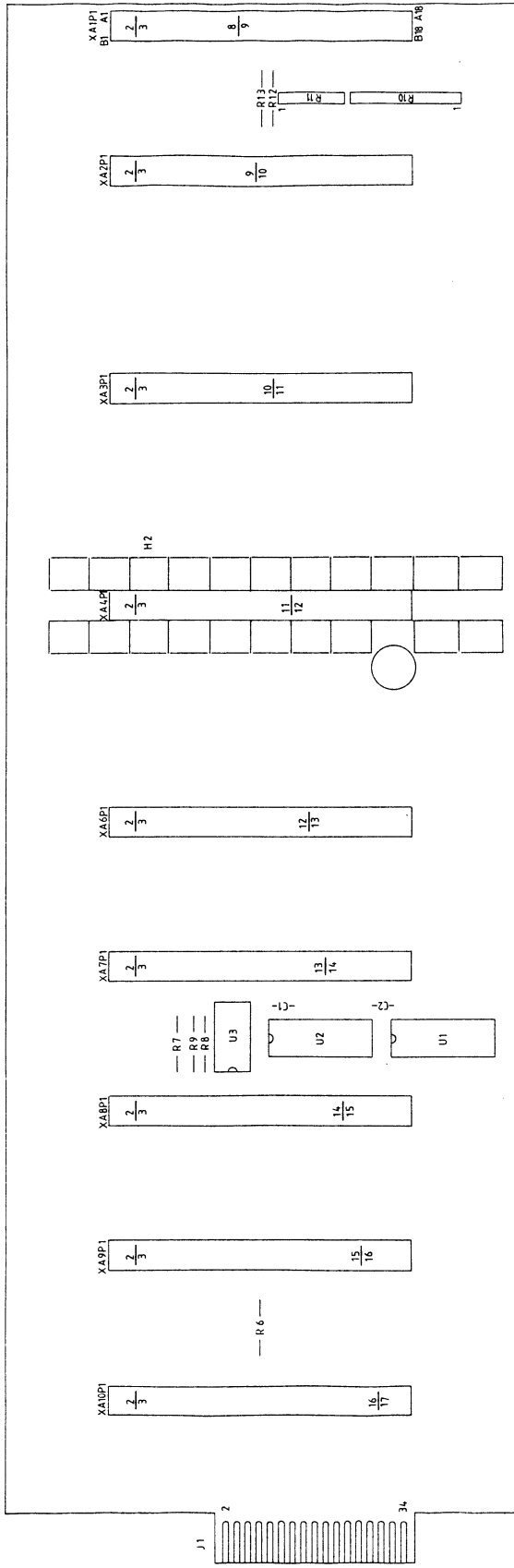
ASSY 448648, MOTHERBOARD ASSEMBLY

Service Sheet A12

1. Data Buffers

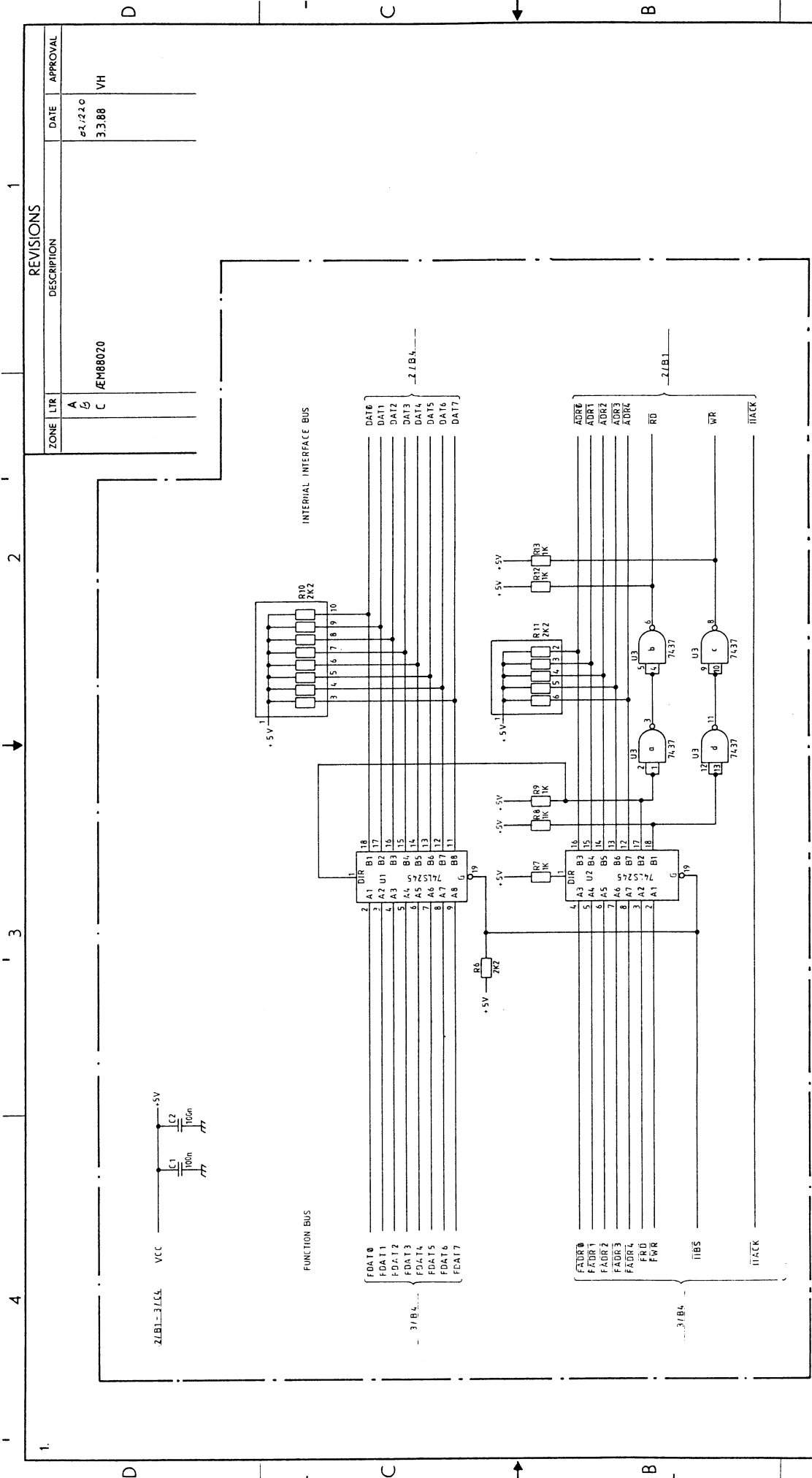
To avoid noise in the more sensitive parts of the exciter, two buffers U1 and U2 separates the internal interface bus from the function bus. The internal interface bus is only active when necessary.

REVISIONS		DATE	APPROVAL
ZONE	LTR	DESCRIPTION	
A	REVISED	810202	3388 VH
B	2008020	6590	VH/GUS
C			
D			



Codepin

Dansk Radio AS		Title	
MOTHERBOARD		8010 16	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. DIMENSIONS IN PARENTHESES ARE IN INCHES. DIMENSIONS IN PARENTHESES ARE IN INCHES. DIMENSIONS IN PARENTHESES ARE IN INCHES.		8010 16	
DR 1/2		8010 16	
CH F8		8010 16	
AP		8010 16	
AP		8010 16	
FIRST ANGLE PROJECTION		8010 16	
CODE IDENT		8010 16	
DRAWING NO		8010 16	
448668		8010 16	
SCALE		8010 16	
1		8010 16	
SHEET 1 OF 1		8010 16	

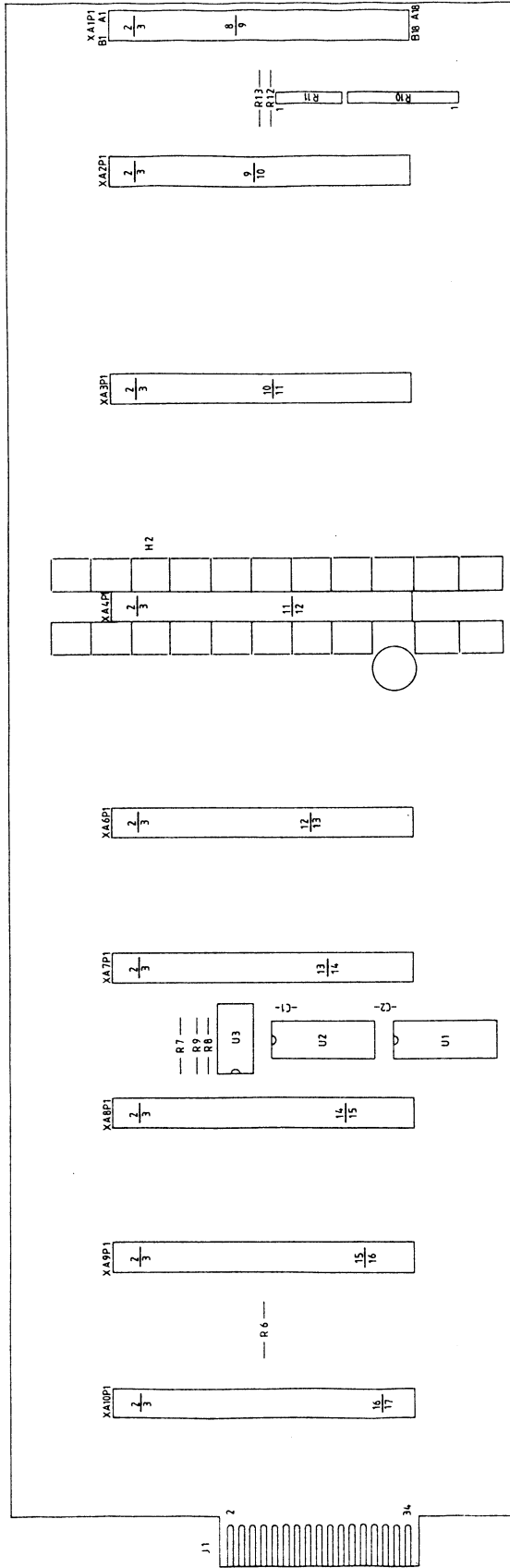


REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVAL
A	1		02/220	
B	2		3.3.88	
C	3	DEM88020		VH

Dansk Radio AS		TITLE:	
MOTHERBOARD		80.08.28	
DR: J. J.		80.10.16	
CH: FB		AP: 1	
AP: 1		FIRST ANGLE PROJECTION	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES IN ACCORDANCE WITH DS 2075		SCALE: 1 OF 3	
45 78 33 RX 4000		SIZE CLASS: A 2	
45 78 33 M 3000		NO: 448648	
NEXT ASSY USED ON		SHEET 1 OF 3	
APPLICATION			

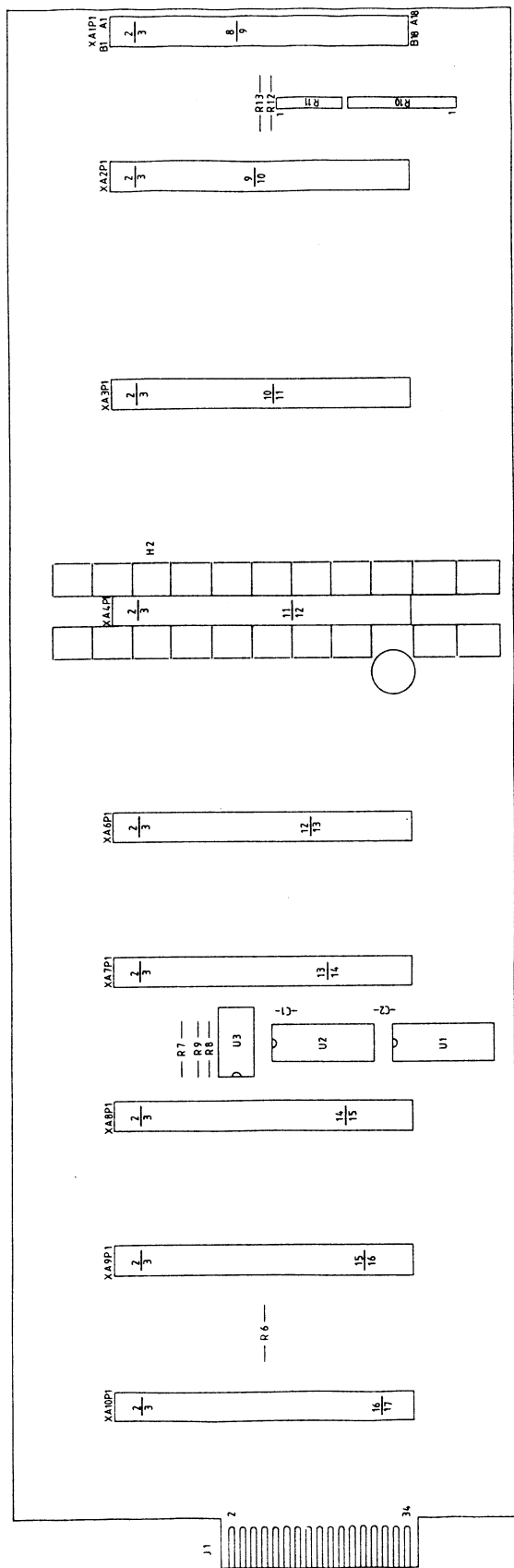
REVISIONS		DATE	APPROVAL
ZONE	DESCRIPTION		
A	REVISED	8/3/02	AC
B	REVISION	3/3/88	VH
C	REVISION	6/9/90	VH/GUS
D	REVISION		



Codepin

Dansk Radio AS		TITLE	
MOTHERBOARD		MOTHERBOARD	
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS AND TOLERANCES ARE IN ACCORDANCE WITH IS 2875		SIZE	
FIRST ANGLE PROJECTION		CODE IDENT DRAWING NO	
APPLICATION		A1	
NEXT ASSY USED ON		446648	
SHEET 1 OF 1		SCALE	

REVISIONS		DATE	APPROVAL
ZONE	LTH	DESCRIPTION	
A		REVISED	
B		REWORKED	
C		REWORKED	
D		REWORKED	



Codepin

Dansk Radio AS		TITLE	
MOTHERBOARD		MOTHERBOARD	
FIRST ANGLE PROJECTION		CODE IDENT DRAWING NO	
A1		448648	
APPLICATION		SHEET 1 OF 1	

