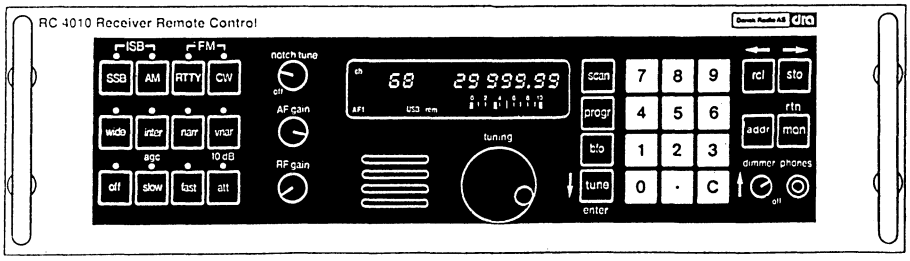
Operating & Service Manual

RC 4010
Receiver Remote Control



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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.

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.

TABLE OF CONTENTS

SECTION 1
GENERAL INFORMATION

1.1 Introduction

This Operating and Service Manual contains information required to install, operate, test, adjust and service the RC4010.

Specifications are listed in paragraph 1.7.
These specifications are the performance standards or limits against which the RC4010 is tested.

Due to the experience obtained from the production and operation of the equipment, minor differences between the RC4010 and the manual can occur.

Wherever possible such differences are covered in Section 7 "MANUAL CHANGES".

The electrical modules of the RC4010 are listed in Section 6.

1.2 Safety Considerations

This manual contains information, cautions and warnings which must be followed to ensure safe operation and to maintain the RC4010 in a safe condition.

1.3 Description

The RC4010 is a remote control unit for the RX4010 receiver allowing full remote control of all functions of the receiver. The remote control is carried out by means of a serial data bus. Two systems are avaiable one of which must be specified:

1) Serial Remote Control Module DRA part no. 471666. 600/1200 bps, conforms to V24/RS232C and V23, incl. AUX port for remote control of external equipment via the serial remote control system of the RX4010.

2) Serial Remote Control Module DRA part no. 490598. 75 to 9600 bps conforms to RS232C, compatible with RS422 and RS485.

1.4 Options

The following extends the usability of the RC4010.

1.4.1 8-line monitor

DRA part no. 471941. Up to four 8-line monitor modules can be installed, enabling monitoring of AF signals from up to 16 RX4010. (4 RX4010 pr. 8-line monitor)

1.4.2 Power Supply

110/220V AC/24VDC alternative power supply to the standard mains only version DRA part no.448532.

1.5 Accessories Supplied.

The following accessories are supplied with the RC4010.

One Operating and Service Manual, DRA part no. 499145
One Power Cord, DRA part no. 490199.

1.6 Accessories Available

The following items are available for use with the RC4010.

RC4010 cabinet, DRA part no. 475246

Rack Slides Kit, Slides with lock. DRA part no. 458872

Rack Slides Kit, Slides with lock and tilt. DRA part no. 496146

Connector Kit for Remote Control Module, DRA part no. 485292

Standard Spare Parts Kit, DRA part no. 475076

Depot Spares Kit. Consult factory.

Special Tools Kit, DRA part no. 475033

1.7 Specifications

1. Modem/Modem Interface Board A9 Assy 471666

Internal Modem	:	V23 CCITT compatible modem Input output impedance 600 ohm balanced Strappable level to -10, -20 or -30 dB Baudrate 1200/600 bps. Operates on either 2 wire or 4 wire leased telephone lines
Modem Interface:		V24 modem interface for interfacing an external modem. 1200/600 bps.
AUX-port	:	8/4 bit input/output AUX-port for external equipment, open collector output max. 15V 100mA.

2. Remote Interface A9 Assy 490598

Baudrate	:	75/150/300/600/1200/2400/4800/9600 bps.
Interface Standards:		1) CCITT V24/RS232C 2) RS422 compatible 3) RS485 compatible
Line Output	:	Balanced 600 ohm/0 dBm adjustable
Connection	:	Sub-D female, 25 poles.

MONITOR OUTPUT

Speaker	:	4W/4 ohm
Phones	:	10 mW/500 ohm

MEMORY

Built-in Lithium battery for appr. 2 years memory back-up

INPUT POWER

110-125 V, 220-250 V, +/-10%, 50-60 Hz, 20-30 VA (dependable of options)

Optional Power Supply: 110/220 V, +/-10%, 50-60 Hz, 20-30 VA
24 Vdc +30/-10%, 0.8-1.2 A (dependable of options)

OPERATING ENVIRONMENT

Temperature	:	Full performance range 0°C to 50°C Operating range -25°C to 55°C
Humidity	:	To 95% relative humidity at 40°C
Vibration	:	MIL-STD-810D-514.3, Category 8, 514.3-1 (10-150 Hz),514.3-34, Category 9.
Shock	:	MIL-STD-810D-516.3, Procedure II (30 g for 20 msec.).

WEIGHT

12.3 kg incl. cabinet excl. options.
Add 0.5 kg when Assy 471666 is installed.
Add 0.25 kg when Assy 490598 is installed.
Add 0.35 kg for each Assy 471941 installed.

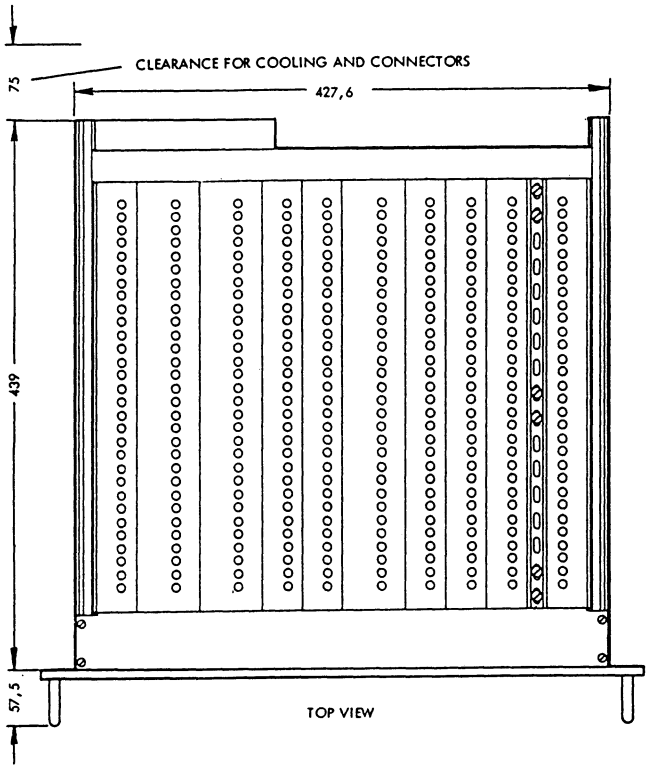
DIMENSIONS

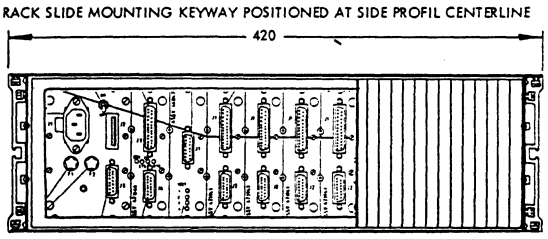
Height:	132.2 mm	INCL. front panel
Width:	482.6 mm	excl. front panel
	427.6 mm	incl. front panel
Depth:	496.5 mm	incl. front panel
	439.0 mm	excl. front panel

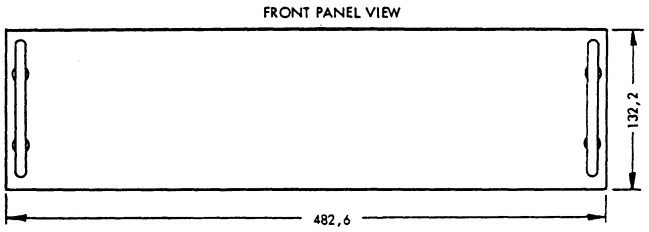
Rear panel clearance for cooling and connectors: min. 75 mm.

RC4010 Cabinet (optional)

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







1.8 Operational Features

DIMMER CONTROL
Continuously variable

AUTO RESTART
Readdressing of last addressed receiver during power failure

Automatic remote transmission error log.

1.9 User Programmable Features

The RC4010 is equipped with extended user programmable features such as:
- a 24 hours' clock with battery back-up.
- Blank display on addressed receiver.
- System scanning.

These information are stored in CMOS memory that maintain its content even though the receiver is turned off or disconnected from power sources.

When the RC4010 is turned on, it will readdress the last addressed receiver before the power was turned off.

1.10 Specification of Options

1.10.1 8-line monitor A5 Assy 471941

Technical specifications

Input	:	8 lines (4 RX4010 can be connected)
Input impedance	:	High impedans or 600Ω selectable.
Input sensitivity	:	0dB, 6dB, 10dB or 12dB can be selected. (gain from input to output)
Connection	:	one sub-D female, 25 poles one sub-D female, 15 poles

SECTION 2
INSTALLATION

2.1 Introduction

This section of the manual provides installation instructions for the RC4010 . 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 RC4010.

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 have been checked for completeness and the RC4010 has been checked mechanically and electrically. If the contents are incomplete, if there is a mechanical damage or defect, or if the RC4010 does not pass the performance tests, notify the nearest Dansk Radio agent. If the shipping container is damaged, or if the cushioning material shows signs 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 RC4010 may be stored or shipped in temperatures within the limits -40°C to +75°C. It is advisable to protect the RC4010 from extreme temperature variation which can cause excessive condensation.

2.4 Repacking for shipment

The shipping container for the RC4010 has been carefully designed to protect the RC4010 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 is planned, 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 RC4010 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, e.g. 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 RC4010 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 RC4010 in the rack mounted configuration requires a standard panel space 5.25 inches high.

The RC4010 may also be mounted in a cabinet for bench operation, part no. 475246. The cabinet is designed to be mounted on a table or on a shelf, fastened to the support by means of four bolts.

When operating the RC4010, provide at least 75 mm of clearance at the rear and at least 7 mm on all sides of the RC4010. Failure to allow adequate air circulation will result in excessive internal temperature, reducing RC4010 reliability.

2.6 Power Requirements

110/220V, +/-10%, 50-60 Hz. Optional: 24VDC, +30/-10%

CAUTION

The RC4010 is normally set at the factory for 220 Vac.

The selection of 110 volt nominal mains voltage is made by changing connections on A10A2 on the power supply assembly A10. To change the mains voltage setting, proceed as follows: (refer to Fig. 2.1 and Fig. 2.20).

a. Disconnect the input power cord from the RC4010.

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 RC4010 side profiles.

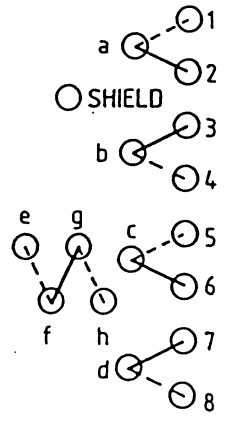
c. Remove the eight screws positioned at the edge of the power supply rear panel A10 and withdraw the power supply assembly.

d. Change connections on A10A2 as appropriate in accordance with Figure 2.1.1 for the AC only version and Figure 2.1.2 for the AC/DC version.

e. Reposition the power supply assembly in the RC4010.

f. Reposition the power supply heat sink panel and connect the regulation transistor cable to A10J2.

g. Connect the input power cord to the RC4010.



Mains strapping 220V

Voltage	Straps
110V	e-f, g-h, a-2, b-3, c-6, d-7
115V	e-f, g-h, a-2, b-4, c-6, d-8
120V	e-f, g-h, a-1, b-3, c-5, d-7
125V	e-f, g-h, a-1, b-4, c-5, d-8
220V	f-g, a-2, b-3, c-6, d-7
225V	f-g, a-2, b-4, c-6, d-7
230V	f-g, a-2, b-4, c-6, d-8
235V	f-g, a-2, b-4, c-5, d-7
240V	f-g, a-1, b-3, c-5, d-7
245V	f-g, a-1, b-4, c-5, d-7
250V	f-g, a-1, b-4, c-5, d-8

Figure 2.1.1 AC version

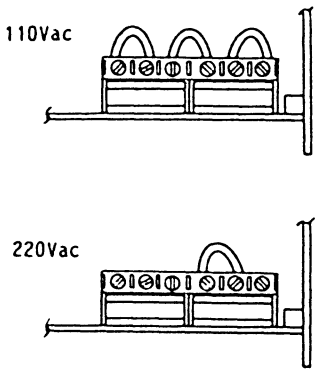


Figure 2.1.2 AC/DC version

2.7 Fuses

Table 2.1 Fuse Ratings

Fuse		Fuse Rating AC version	AC/DC version
Rear Panel	F1	1A T (220 V) 2A T (110 V)	1A T (220 V) 2A T (110 V)
" "	F2	1A T (220 V) 2A T (110 V)	6.3A T (24 V)
On A10A2	F3	6.3A T	
" "	F4	6.3A T	
" "	F5	6.3A T	

2.8 Power Cable

In accordance with international safety standards this RC4010 is equipped with a three terminal power connector. When connected with an appropriate power cable, the RC4010 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 Inputs/Outputs

2.9.1 Audio Input/Output A10J3

The audio input/output socket (refer to Figure 2.2.1 and 2.2.2) provides loudspeaker output and sidetone input (later used during simplex A1 keying).

2.9.1.1 Assembly 471720
Sub-D, Female, 15 poles, Screewing lock

The audio input/output socket connections are as follows:

pin		
3	Sidetone input	100-500 mV/600 ohms
10	Sidetone GND	
6	Line output	
7	Line output centertab	600 ohms Balanced
8	Line output	
2	Line input	600 ohms Balanced
9	Line input	
11	Line GND	
14	Speaker output	4 W/4 ohms
13	Speaker GND	

Figure 2.2.1 Audio Input/Output Plug. Assembly 471720.

Note that the outputs will follow the monitored sideband in ISB modes. (As selected by the "mon" pushbutton on the front panel).

The appropriate cable connector may be ordered from Dansk Radio. Part no. 495980.

2.9.1.2 Assembly 448532
Sub-D, Female, 9 poles, Screewing lock.

The audio input/output socket connections are as followa:

pin		
1	Sidetone input	100-500 mV/600 ohms
2	Sidetone GND	
4,7	Speaker output	4 W/4 ohms
5,6	Speaker GND	

Figure 2.2.2 Audio Input/Output Plug. Assembly 448532.

The appropriate cable connector may be ordered from Dansk Radio. Part no. 496006.

2.9.2 Remote Control RS232/422/485 A9J7

Sub-D, Female, 25 poles, Screewing lock.

The connector provides data signals, mute input (RS232C voltage level, positive logic) and a 0 dBm balanced line output adjustable by means of R12 located on the PCB.

The connections are as follows:

pin	circuit	description
1	GND	Protective GND
2	TXD	Transmitted data RS232
3	RXD	Received data RS232
4	RTS	Request to send RS232
5	CTS	Clear to send RS232
6	DSR	Data set ready RS232
7	GND	Signal GND
9	Line out	Balanced 600 ohm
10	Line out	"
11	MUTE	Receiver muting
18	TXD/A	Transmitted data RS422
19	TXD/B	Transmitted data RS422
23	RXD/TXD A	Received data RS422/Data RS485
24	RXD/TXD B	Received data RS422/Data RS485

Figure 2.7 Remote Control RS232/422/485

The appropriate cable connector may be ordered from Dansk Radio Part no. 496014.

2.9.3 Modem/Modem Interface A9J7

Sub-D, Female, 25 poles, Screewing lock.

The connector provides CCITT V24/RS232 modem interface and CCITT V23 telephone line signals.

The connections are as follows:

pin	circuit	description
9	Line A	Telephone line 600 ohms Bal.
10	Line A	"
11	Line B	Telephone line 600 ohms Bal.
25	Line B	"
2	TXD	Transmitted data
3	RXD	Received data
4	RTS	Request to send
5	CTS	Clear to send
6	DSR	Data set ready
7	GND	GND
1	GND	GND
8	CD	Carrier detect
20	DTR	Data terminal ready

Figure 2.8 Modem/Modem Interface.

The appropriate cable connector may be ordered from Dansk Radio Part no. 496014.

2.9.4 Auxiliary Input/Output A9J6 (Optional).

Sub-D, Female, 15 poles, Screewing lock.

The Connector provides a 4-bit Input port and an 8-bit Output port.

The Outputs are open collectors max. 15V/50 mA. The Inputs are RS232C level. The $\overline{\text{Enable}}$ is TTL. Input data transfer takes place only when $\overline{\text{Enable}}$ is low.

The connections are as follows:

pin	
9	+15 V
14	$\overline{\text{Enable}}$
1	Input 0
2	Input 1
3	Input 2
4	Input 3
5	Input 4
6	Input 5
7	Input 6
8	Input 7
10	Output 3
11	Output 2
12	Output 1
13	Output 0
15	GND

Figure 2.9 Auxiliary Input/Output.

The appropriate cable connector may be ordered from Dansk Radio Part no. 495980.

2.9.5 Control Input/Output, A8J1

Not used.

2.9.6 Open Collector Outputs, A8J2

Not used.

2.10 Strapping

In order to get a proper function of the RC4010, it is nescessary that some of the assemblies are strapped correctly. Normally the RC4010 is delivered from the factory with the correct strapping. If a module is exchanged, the strapping should be checked.

Strapping of the A8 Assembly are covered in the circuit description of the assemblies. See diagram section.
Strapping of the Power Supply is covered in the beginning of this section. Strapping of other assemblies that above mentioned are covered in Section 4 and Section 5.

2.11 Installation Check-out

When the installation is complete, refer to section 3 (OPERATION) and fully check the operation of the RC4010.

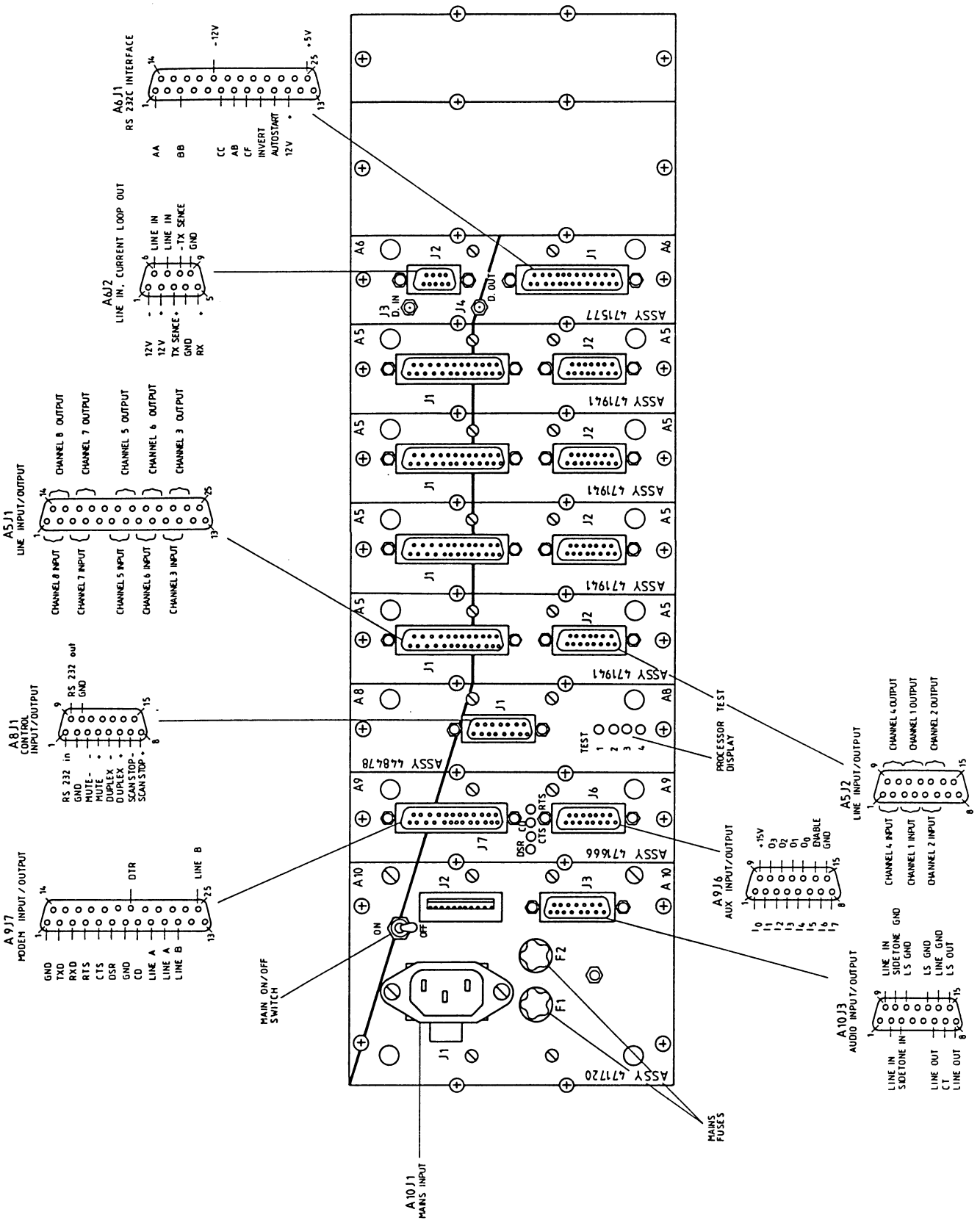


Figure 2.20 Rear Panel View.

SECTION 3
OPERATION

3.1 Introduction

This section of the manual contains instructions for proper operation of the RC4010

3.2 Introduction to remote control

For the RX4010 to be remote-controlled, a remote module A9 has to be installed in slot 9. If the remote control system includes more than one RX4010, an optionary 8-line monitor is available. The 8-line monitor module has 8 AF-inputs and one output for the RC4010, making it possible to monitor an addressed RX4010. A RC4010 can be adapted with max. 4 pcs. 8-line monitors to monitor up to 16 RX4010 receivers. When remote controlling a RX4010, the RC4010 should be operated as though the RX4010 was operated locally. See operating manual for the RX4010.

3.3 Front Panel Features

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

3.4 Initial Conditions

After the power has been switched on, the RC4010 will address the same unit as before the power was switched off. If the unit don't answer the display shows e.g. "no rEc 2". If another RC4010 has the command of the line, the display shows "OFF buSy".

NOTE

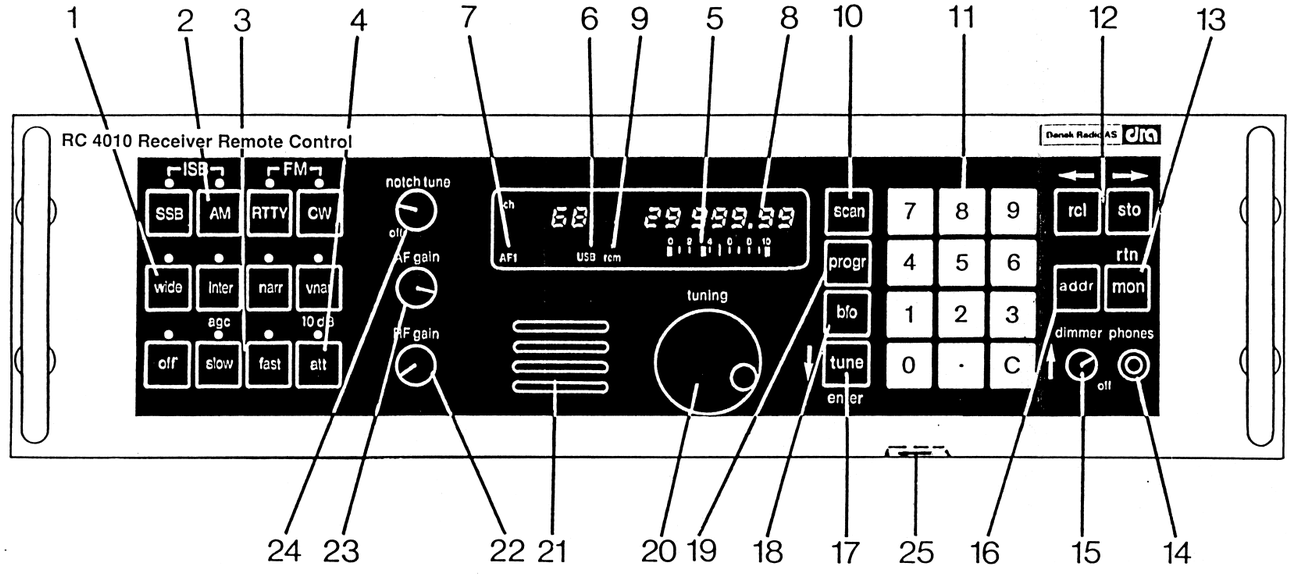
1. If the display reads "Err. bAttEry" the battery backup is faulty and all data is cleared.

2. If the display reads "no Axx" (xx is a twodigit number) the Axx module is not installed or a failure is found on the module.

3.5 Self Test

The self test operations are initiated by utilizing a program function. The self test is then carried out by the built-in microprocessor by means of a ROM-based diagnostic program package. For futher information see section 8.

Figure 3.1
Front Panel Features



1 BANDWIDTH group. These keys select the IF-bandwidth when the receiver is operated in AM- , RTTY 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 10dB attenuator in the receiver front end. Used to further improve the receiver's large-signal response.

5 S-METER. Analogue indication of the received signal strength.

6 LSB/USB indicator.

7 MONITOR indicator.

8 ALPHANUMERIC display. Displays address, the receiving frequency, the BFO-frequency, error codes and failure modes.

9 REMOTE annunciator. Indicates that the receiver is remotely controlled by a master. Flashing indicate that RC 4010 is in local programming mode.

10 SCAN key. Selects the automatic and the manual scanning mode.

11 ENTRY group. This group includes the numeric data keys an the clear key.

12 REGISTER group. These keys are used for storing and recalling of user-programmed receiver settings. The recall key is also used for selection of international communication channels.

13 MONITOR connect the speaker to LSB or USB in ISB mode.

14 PHONES output. Connection for head phones. Disconnects the internal speaker.

15 DIMMER/POWER control. Used for control of the light intensity in the front panel indicators.

16 addr key. Used to addressing a receiver

17 TUNE key. Enables/disables free tuning by the control knob.

18 BFO key. Enables/disables the BFO control mode.

19 PROGRAM key. Key for entering the program mode.

20 TUNING control. Used for free-tuning of the receiving frequency and the BFO frequency.

21 LOUDSPEAKER

22 AF-GAIN/SQUELCH control. Used during AGC " off" manually to adjust the intermediate frequency gain.

23 AF-GAIN control. Manual adjustment of the audio frequency gain.

24 NOTCH-TUNE control. Manual adjustment of an audio frequency notch filter, tunable in the range 300 Hz to 3400 Hz. Used to attenuate undesired interfering signals in the audio output.

25 LOUDSPEAKER ON/OFF switch mounted on bottom of frontpanel.

3.6 Addressing

When control of a RX4010 is wanted, the RX4010 has to be addressed.
By pressing (addr) the display shows e.g. "Adr. rEc. 2" where 'rec. 2' is the last addressed RX4010. You can now:

- Select another type of unit with "back arrow" or "forward arrow" keys. The display will then change between: "SE" (SE4010), "rEc." (RX4010), "tc" (TC4010), "rc" (RC4010), "Edp".

- Select another address with the numerics. The address has to be in the interval 1 - 31.

- execute the addressing of the unit shown by pressing enter The last adressed unit will be disaddressed and the new one addressed.

- Leave the mode without addressing by pressing (rtn) .

- Disaddress by pressing (C) . The display will show "dis rECyy", where 'rECyy' is the unit which will be disaddressed if the (enter) key is pressed.

For disaddressing of master RC4010 see paragraph 3.9.

3.7 Local mode

Local mode is selected by pushing (addr) and is indicated by a flashing "rem" annunciator. To return to remote mode press (rtn)
In local mode the following operations are possible:

3.7.1 Clear all

WARNING

This rutine erases all data stored in the programmable memory.
If the rutine is used in remote mode, all data stored in the programmable memory of the addressed RX4010 will be erased.

To clear all user programmable memories:

- press (sto) and agc(off) at the same time.

- the display will show "CLr ALL."

If the (sto) key is pressed within 2.5 sec. the command will be executed.

If no key is pressed within 2.5 sec. or if other key but (sto) is pressed, the program function will be left, and the RC4010 returns to local mode.

3.7.2 Introduction to the program function

Selecting the program function.

NOTE: Paragraph 3.7.2 describes program functions of the RC4010 when operated in local mode. For program functions useable in remote mode, please refer to the operating manual of the RX4010.

The program function is selected by pressing the (PROGR) key followed by the program number. The program number is accepted by pressing the (enter) key.

A main menu for the selected program is displayed. By using the horizontal arrow keys, sub menus will be displayed (if any).

A menu (main or sub) is accepted by pressing (enter)
Now the display is scrolled through messages using the vertical arrow buttons. If sub messages excist to a message, these are recalled by the horizontal arrow buttons.

The last messages is followed by a return to the former setting of RC4010 when the downwards arrow button is pressed.

When in a program function the (rtn) key may be used to return to the address mode.

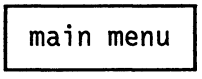
Selection of a program function does not effect the remote communication of the RC4010.

Selecting a local program causes the "rem" annunciator flashing.

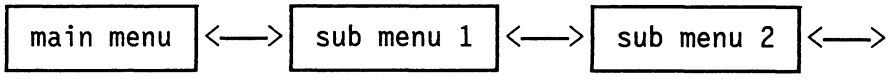
The operation of the programs can be illustrated in this way:

1) Select the program.

2) The main menu will be displayed.

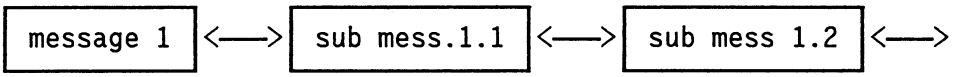


3) The menus are scrolled by (<--) and (-->) keys.

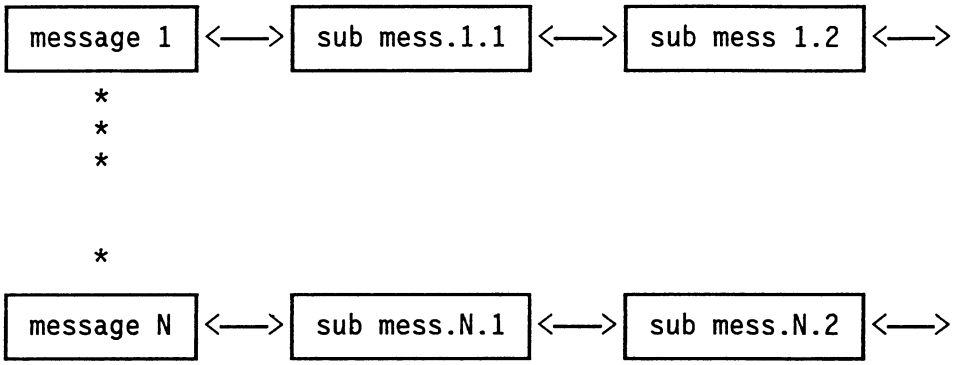


4) The first message is displayed when a menu is selected by pressing (enter) while the menu is shown.

5) Sub messages may be scrolled using (<--) and (-->) keys.



6) Messages are scrolled using the down arrow and the up arrow keys



7) Pressing the down-arrow keys after the last message returns the RC4010 to the former setting.

The RC4010 has several programs:

Program 1: 24 hours clock
Program 15: System scan programming
Program 16: System scan program start
Program 20: Baudrate selection
Program 21: Blank display setting
Program 41: Automatic Remote Transmission Error Log (ARTEL)
Program 42: Acumulated on-time.
Program 49: Self test (see section 8)

3.7.2.1 Clock Viewing and Setting

Program 1.

When program 1 is selected "CLO. rcl." will appear in the display. By using "forward arrow" key the display is changed to "CLO. Sto.".
"CLO. rcl." is for Clock Viewing and "CLO. Sto." is for Clock Setting. Scrolling between the two displays is accompliched by using "forward arrow" key and "back arrow" key.

The wanted menu is selected by the (enter) key.
Pressing the "up-arrow" key after a menu has been selected, returns display to the menu.
After selection of menu, date and time are scrolled using "up arrow" and "down arrow" keys.

In "clock store" mode a flashing digit indicates the digit which might be changed entering a new digit by the numeric keyboard.
The "forward arrow" and the "back arrow" keys are used to select the digit which is going to be changed. The date is changed first and accepted by the enter key. Then the time is displayed and changings accepted by the enter key.

Example, Clock Viewing:

keystrokes	display		
	Adr.	rEc. 10	
(progr)	PrG	no.	
(1)	PrG	no. 1	
(enter)	CLO.	rcl.	
(enter)	dAt.	91-10.12	(oct. 12. 1991)
(enter)	ti.	16-44.48	(16h 44min 48sec)
(enter)	Adr.	rEc. 10	

Example, Clock Setting:
Change date to jan. 14. 1990 and the time to 16.54.00.
(an underline denotes flashing digit).

keystrokes	display	
	Adr.	rEc. 10
(progr)	PrG	no.
(1)	PrG	no. 1
(enter)	CLO.	rcl.
(-->)	CLO.	Sto.
(enter)	dAt.	90-10.12
(-->)	dAt.	90-10.12
(-->)	dAt.	90-10.12
(0)	dAt.	90-00.12
(1)	dAt.	90-01.12
(-->)	dAt.	90-01.12
(4)	dAt.	90-01.14

enter	ti.	16-44.48
-->	ti.	16-44.48
-->	ti.	16-44.48
5	ti.	16-54.48
-->	ti.	16-54.48
0	ti.	16-54.08
0	ti.	16-54.08
enter	Adr.	rEc. 10

3.7.2.2 System scan programming
program 15

By remote systems with more than one receiver remotely controlled from one RC4010, program 15 enables scanning of the receivers in order to get status information of each receiver in a quasi continous way.

By selecting program 15 the display shows "Adr. rEc. ". Now each of the addresses of the RX4010 which wants to be scanned is keyed-in followed by enter . When all addresses are entered press enter again and the display will show "dll. ti.= ". Key-in the dwell time between 3 and 99 sec. and press enter to finish the program. Note: The dwell time includes 2 sec. displaying of the address.

After the program is entered it can be revised by selecting program 15 again and scroll the program by the "up arrow" and "down arrow" buttons. A RX4010 address is changed by entering a new address. To delete a RX4010 address press addr 0 and enter .

Example 1: Scan receivers with addresses 1, 3, 5, 2 and with dwell time = 10 sec.

keystrokes	display	comments
	Adr. rEc. 10	
progr	prG. no.	
1	prG. no. 1	
5	prG. no. 15	select program 15
enter	Adr. rEc.	
1	Adr. rEc. 1	select receiver 1
enter	Adr. rEc.	
3	Adr. rEc. 3	select receiver 3
enter	Adr. rEc.	
5	Adr. rEc. 5	select receiver 5
enter	Adr. rEc.	
2	Adr. rEc. 2	select receiver 2
enter	Adr. rEc.	
enter	dll. ti.=	
1	dll. ti.= 1	
0	dll. ti.= 10	dwell time = 10
enter	Adr. rEc. 10	

Example 2: Change program to receiver addresses 1, 5, 7, 11 with dwell time = 5 sec.

keystroke	display	comments
	Adr. rEc. 10	
progr	prG. no.	
1	prG. no. 1	
5	prG. no. 15	select program 15
enter	Adr. rEc. 1	
enter	Adr. rEc. 3	
0	Adr. rEc. 0	delete receiver 3
enter	Adr. rEc. 5	
enter	Adr. rEc. 2	change receiver 2
7	Adr. rEc. 7	to receiver 7
enter	Adr. rEc.	
1	Adr. rEc. 1	
1	Adr. rEc. 11	select receiver 11
enter	Adr. rEc.	
enter	dll. ti.= 10	change time = 10
5	dll. ti.= 5	to time = 5
enter	Adr. rEc. 10	

3.7.2.3 Start system scaning

Program 16

To start system scanning select program 16 and press enter The RC4010 will then start the scanning sequence defined by program 15. The address of the first RX4010 will be shown for 2 sec. followed by the set-up, then the address af the second RX4010 and so on. When the set-up of the last receiver in the sequence has been shown, it will start all over again. The rtn key stops the scanning and returns the RC4010 to addressing mode.

Error message:

Err. no proG.	No program is entered.
OFF buSy	This RC4010 has not the command over the line.

Example:

keystrokes	display	comments
	Adr. rEc. 10	
progr	prG. no	
1	prG. no 1	
6	prG. no 16	select program 16
enter	Scn. StArt	start scanning
enter	Adr. rEc. 1	displayed 2 sec.
	1111.11	displayed 3 sec.
	Adr. rEc. 5	displayed 2 sec.
	5555.55	displayed 3 sec.
	Adr. rEc. 7	displayed 2 sec.

```
        7777.77      displayed 3 sec.
Adr.  rEc.  11       displayed 2 sec.
       11000.00      displayed 3 sec.
Adr.  rEc.   1       displayed 2 sec.
          1111.11      displayed 3 sec.
          *
          *
          *
```

3.7.2.4 Baudrate setting

Program 20

Before using the RC4010, the baudrate must be set. When program 20 is selected the last entered baudrate e.g. "bAu 75" will appear on the display. By using "back arrow" or "forward arrow" keys the baudrate is changed. Baudrate is accepted by (enter) key.

Note: The baudrate selected must equals the baudrate strapped on the A9 module.

Example:

keystrokes	display	comments
	Adr. rEc. 10	
(progr)	prG. no	
(2)	prG. no 2	
(0)	prG. no 20	select program 20
(enter)	bAu 75	
(-->)	bAu 150	
(-->)	bAu 300	
(-->)	bAu 600	select 600 bit/sec.
(enter)	Adr. rEc. 10	

3.7.2.5 Blank display setting

Program 21

Blanking of the display of the addressed RX4010 can be carried out by program 21. "SEt. diSP" will appear on the display when the program is selected. "Back arrow" or "forward arrow" keys change the display to "SEt no diSP." Press enter key to accept. The following addressed receivers will blank the display except the "rem" annunciator. To switch on the display, address the receiver with program 21. Set to "SEt diSP." or switch the receiver off and on.

Example:

keystrokes	display	comments
	Adr. rEc. 10	
progr	prG. no	
2	prG. no 2	
1	prG. no 21	select program 21
enter	SEt diSP.	
-->	SEt no diSP.	blank display select
enter	Adr. rEc. 10	

3.7.2.6 ARTEL Automatic Remote Transmission Error Log
Program 41

By recalling program 41 information about remote transmission since the RC4010 has been switched on will be displayed.
The maximum number which can be displayed is 65535. In cases where the number exceeds 65535, the counter(s) are reset and the counting proceeds from 0.

When program 41 is selected the display shows "r.Fr. 823". The information are now scrolled using the "down arrow" and the "up arrow" keys. For explanation of remote transmission codes see section 8. Press rtn to leave program 41 or "down arrow" when the last code is displayed.

Example:

keystrokes	display
	Adr. rEc. 10
progr	PrG no.
4	PrG no. 4
1	PrG no. 41
enter	r.Fr. 111
enter	r.bt. 222
enter	Syn. 333
enter	Hd.E. 444
enter	to.E. 555
enter	Fr.E. 666
enter	or.E. 777
enter	Pt.E. 888
enter	to.S. 999
enter	Adr. rEc. 10

3.7.2.7 Acumulated on-time.
Program 42

An internal counter in the RC4010 counts the number of hours during which the RC4010 has been switched on.

When program 42 is selected the display will appear as "P.on XXXXXXX". XXXXXXX is accumulated on-time for the RC4010.

To leave the program press (enter) or (RS) .

3.8 Give command to another RC 4010

If there is more than one RC4010 connected to the line, the command can be given to another RC4010. This is done at the same way as addressing of a RX4010 see section 3.6. After addressing another RC4010 the display will show e.g. "OFF rc 4", which indicates that the command has been given to the Receiver Control Unit with address 4. The command can only be returned if the RC4010 is addressed by the equipment which presently has the command or if the mains is switched off and on.

Note: If the RC4010 is off the adressing mode can not be used.

Example: Give the command to RC4010 address 4.

keystrokes	display	1234.56
(addr)	Adr.	rEc. 1
(-->)	Adr.	tc 1
(-->)	Adr.	rc 1
(4)	Adr.	rc 4
(enter)	OFF	rc 4

3.9 Master RC4010 (address 31):

When a master RC4010 is switched on, the communication on the line will be shown. When an addressing is executed on the line the address will be displayed for 2 sec.. If the (addr) key is pressed the last executed addressing on the line will be shown.

A master RC4010 can interrupt the communication and take over the command. This is done by normal addressing see section 3.6.
When disaddressing, two modes are available by toggling the (C) key:

1) "diS LinE": Disconnects the line and returns the command to the RC4010 which was interrupted.

2) "diS rECyy": Disconnects unit 'rECyy'.

The disconnecting is accepted by pressing (enter) .

3.10 Error message:

OFF buSy	Another RC4010 is communicating on the line. No address can be entered.
OFF rc xx	RC4010 has given the command to RC4010 address xx.
no rEc. xx	RC4010 tries to address RX4010 address xx, but no answer is received.
Err. OFFLinE	Error on line or some of the addressed unit is switched off.
no Adr.	No valid address.
Err. no ProG.	No system scan program is entered.

SECTION 4
OPTIONS

4.1 Introduction.

This section provides information about optional modules.

4.2 8-line Monitor assembly A5, assy 471941

The 8-line monitor is used when more than one RX4010 is connected to the RC4010, in order to monitor audio signals from the current controlled receiver.

4.2.1 Description

The functional blockdiagram of the 8-line monitor is shown in figure 4.1
Each of the eight input lines are furnished with a protection circuit. The microprocessor select one of the lines through an analog switch. The signal from the selected line is transformed from balanced to an unbalanced signal and filtred before it is send to the AF output pin.

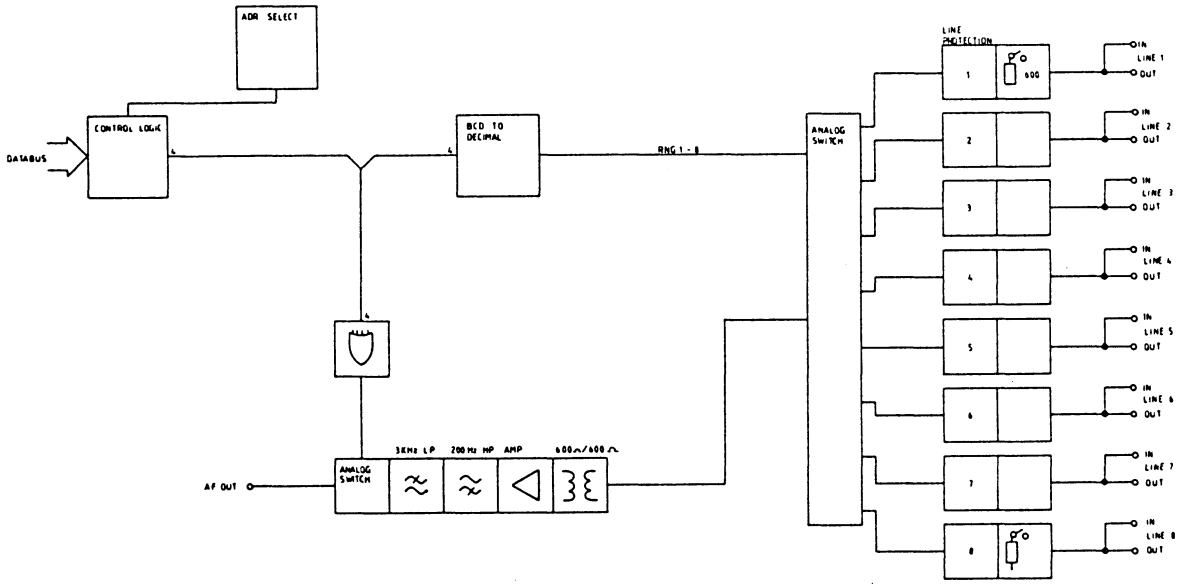


fig 4.1
blockdiagram 8-line monitor

4.2.2 Inputs

A. Monitor channels 4 - 8, A5J1

Sub-D, female, 25 poles.

The socket A5J1 provides inputs and outputs for monitor channels 4, 5, 6, 7 and 8. The inputs and outputs are coupled in parallel.

The connections are as follows:

pin	description
1	channel 7.a in
2	channel 7.b in
3	channel 8.a in
4	channel 8.b in
5	not used
6	channel 6.a in
7	channel 6.b in
8	channel 5.a in
9	channel 5.b in
10	channel 4.a in
11	channel 4.b in
12	not used
13	not used
14	channel 7.a out
15	channel 7.b out
16	channel 8.a out
17	channel 8.b out
18	not used
19	channel 6.a out
20	channel 6.b out
21	channel 5.a out
22	channel 5.b out
23	channel 4.a out
24	channel 4.b out
25	not used

fig 4.2
connections A5J1

B. Monitor channel 1 - 3, A5J2
Sub-D, female, 15 poles.

The socket A5J2 provides inputs and outputs for monitor channels 1, 2 and 3. The inputs and outputs are coupled in parallel.

The connections are as follows:

pin	description
1	channel 3.a in
2	channel 3.b in
3	channel 2.a in
4	channel 2.b in
5	channel 1.a in
6	channel 1.b in
7	not used
8	not used
9	channel 3.a out
10	channel 3.b out
11	channel 2.a out
12	channel 2.b out
13	channel 1.a out
14	channel 1.b out
15	not used

fig 4.3
connections A5J2

4.2.3 Connection between RX4010 and 8-line monitor

Up to four 8-line monitors can be installed in the RC4010. The 8-line monitor(s) shall be strapped to the correct address range, as shown in section 4.2.4. Connections between RX4010 and 8-line monitor are shown on fig 4.4 (RX4010 ISB version) and fig 4.5 (RX 4010 SSB version).

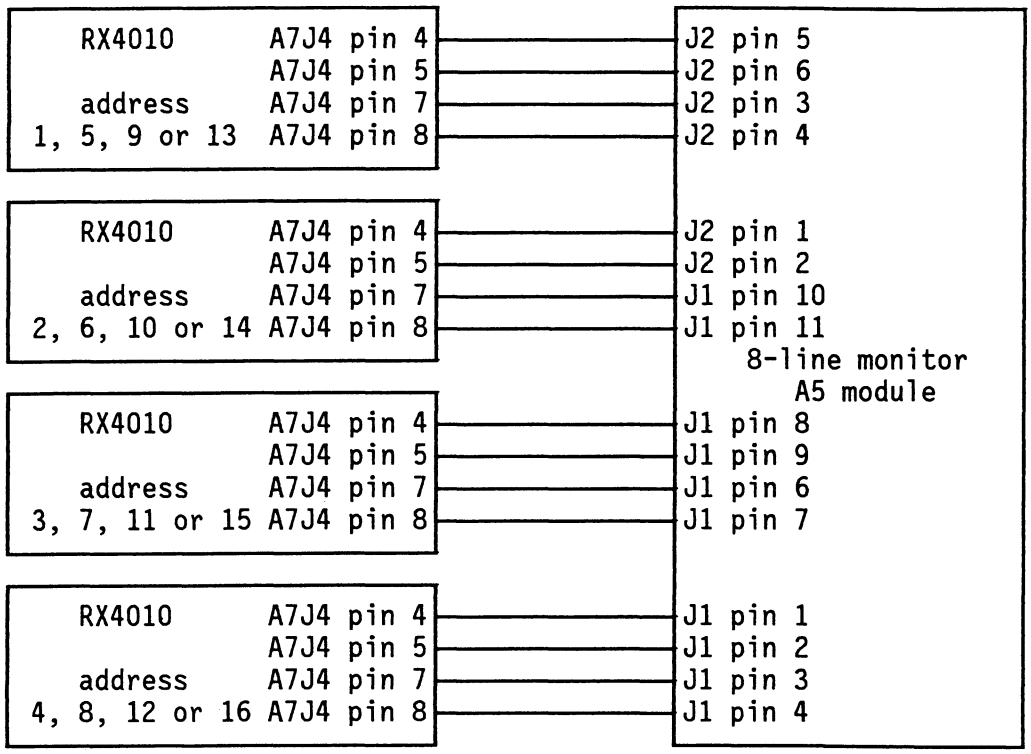


fig 4.4
Connection between RX4010 (ISB version) and 8-line monitor

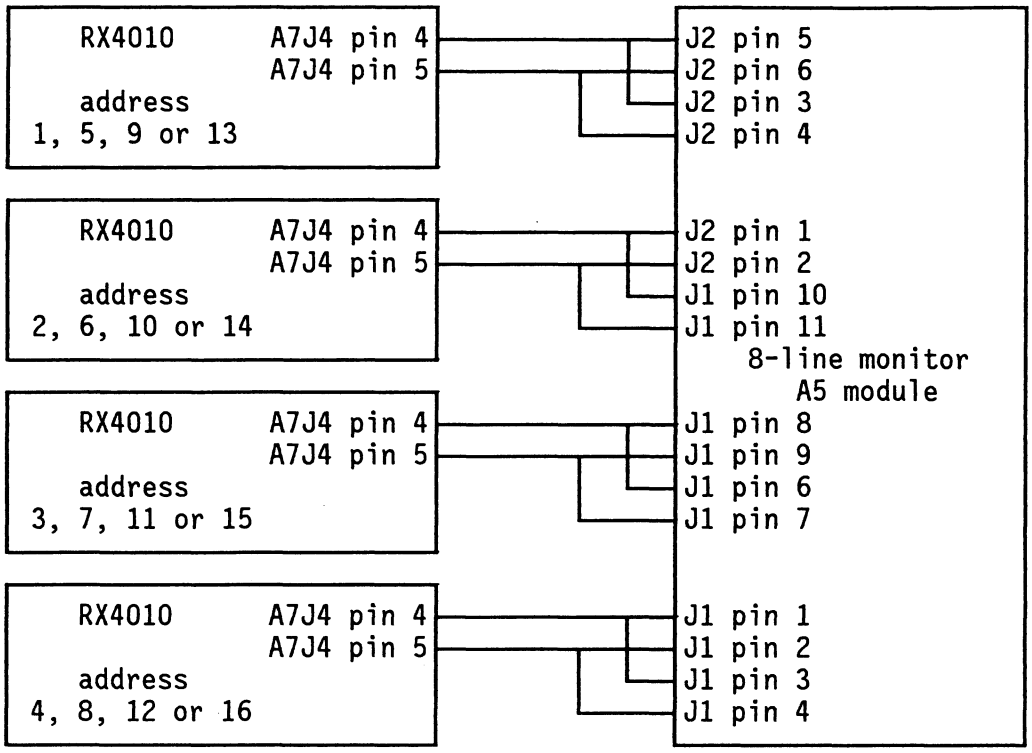


fig 4.5
Connection between RX 4010 (SSB version) and 8-line monitor

4.2.4 strapping

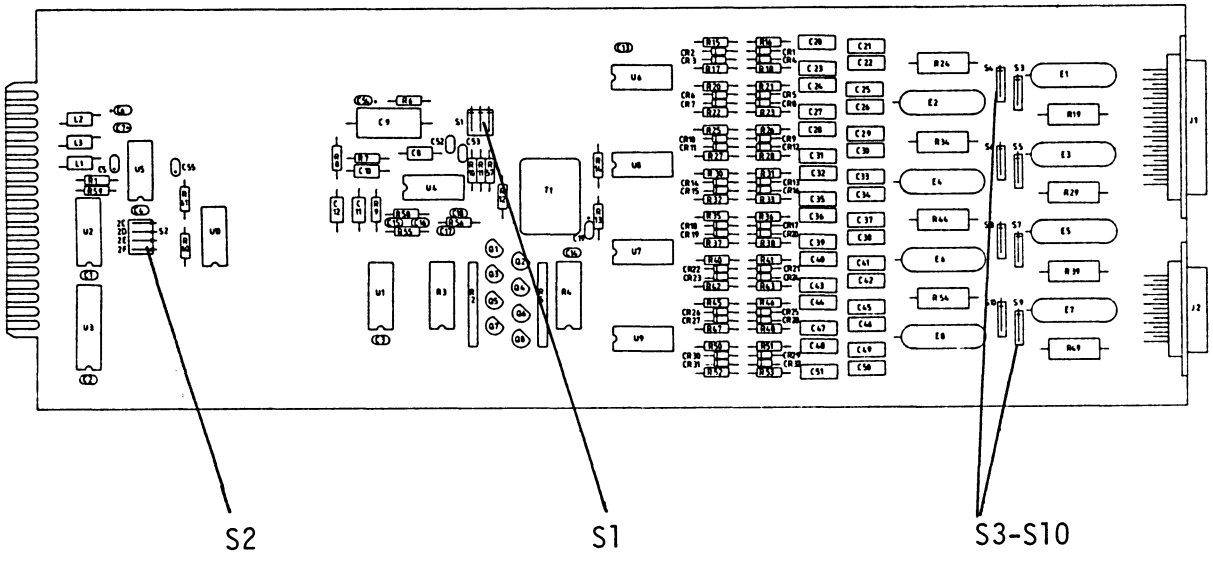


fig 4.5
Switch on A5 modul

The A5 modul are given a dedicated address strapped at S2.

modul	address area	strap
A5.1	1- 4	S2 A
A5.2	5- 8	S2 B
A5.3	9-12	S2 C
A5.4	13-16	S2 D

Input sensitivity ie. amplifier gain is adjusted by S1. Maximum sensitivity is obtained by switching all straps "on". For Minimum sensitivity all switches shall be "off".
Gainselection:

no swithes "on" : 0 dB
1 switch "on" : 6 dB
2 switches "on" : 10 dB
3 switches "on" : 12 dB

Line impedance is selectable with switches S3 to S10.
when "off" high impedance is selected
when "on" 600 ohm is selected.

5 REMOTE CONTROL

5.1 Introduction

This section provides information on remote control of the RX4010 receiver and the SE4010 Synthex. The RX4010 and SE4010 may be remote controlled by the RC4010 receiver controller and the TC4010 transmitter controller or a remote computer may be used.

5.2 Standard Remote Control

The remote control is obtained via the Standard Remote Interface A9, part No. BR490598. With this assembly the following interface standards are possible: RS232C, RS422 and RS485. Technical specifications of this module are listed in Section 1.

The receiver RX4010 and the exciter SE4010 may be remote controlled in a number of different ways. Section 5.2.2 provides description of the different types of remote configurations.

When a certain configuration for the remote control has been chosen, baudrate and communication setups must be selected via program 20. Also the Standard Remote Interface A9 must be strapped in accordance to the selected interface standard and baud rate.

Section 5.2.1 provides a description of baudrate and communication setups in program 20.

Section 5.2.3 describes strapping of the Standard Remote Interface A9.

5.2.1 Baudrate and Communication Setups
Program 20

Program 20 offers possibility of selection of: number of stop bits, parity control, baudrate and delays. These features can be used where speciel requirements for the remote communication exist. During normal operation where the RX4010 or SE4010 is remote controlled by a RC4010 or TC4010 the recommended standard communication setups will normally result in a succesfull remote communication. The recommended standard communication setups are listed in table 5.1 next page.

Table 5.1 Recommended standard communication setups

strapped baudrate tab.5.10	Program 20 selection					
	Baudrate	Stop bit	Parity	Frame gap	Eto.	dEL.
75	75	1	odd	255	0	0
110	75	1	odd	200*	0	0
150	150	1	odd	147	0	0
300	300	1	odd	074	0	0
600	600	1	odd	037	0	0
1200	1200	1	odd	019	0	0
2400	2400	1	odd	009	0	0
4800	4800	1	odd	006	0	0
9600	9600	1	odd	006	0	0

* Recommended standard frame gap time is automatically selected by pressing the **[RCL]** key. If 110 baud is selected the frame gap time must be selected to 200mS via the numeric keys.

Where speciel requirements for the serial remote communication exist, these requirements may be satisfyed via selection of the wanted parameters in program 20. Selection of baudrate and communication setups in program 20 are described in the following.

The remote protocol defines the use of 8 bits of data. This parameter can not be changed!

When program 20 is selected, the display shows **"SEL. StP.b. X"**, where **"X"** is the number of stopbits. The number of stopbits can be selected between 1, 1.5 and 2 using the **[←]** or **[→]** keys.

The number of stop bits is accepted by pressing the **[enter]** key.

The display will now show **"SEL. PAr. Y"**, where **"Y"** indicates odd, even or no parity displayed by **"odd"**, **"evn"** or **"OFF"**.

The wanted parity is selected using the **[←]** or **[→]** keys.

The selected parity is accepted by pressing the **[enter]** key.

The display will now show **"SEL. bAu. Z"**, where **"Z"** indicates the baud rate.

The possible baud rates are:

Z = 75, 150, 300, 600, 1200, 2400, 4800 or 9600 baud.

The baud rate is selected using the **[←]** or **[→]** keys.

The baud rate is accepted by pressing the **[enter]** key.

If 110 baud remote communication is wanted, Z = 75 must be selected. The actual selection of 110 baud is carried out by hardware strapping of the Standard Remote Interface (refer to table 5.10).

The display will now show **"SEL. FrG. x"**, where **"x"** indicates the "frame gap time" in milli seconds. The frame gap time equals the time from the last received byte to system acception of the total communication frame. The frame gap time can be selected between: 0 - 255mS.

The frame gap time is selected via the **[RCL]** key or the numeric keys. By pressing the **[RCL]** key a standard frame gap time (shown below) for the previous selected baud rate will appear on the display. In case the standard frame gap time is not wanted the frame gap time can be keyed in using the numeric keys. The displayed frame gap time is accepted by pressing the **[enter]** key.

Standard frame gap times:

If 75 Baud then x = 255
If 110 Baud then x = 200*
If 150 Baud then x = 147
If 300 Baud then x = 074
If 600 Baud then x = 037
If 1200 Baud then x = 019
If 2400 Baud then x = 009
If 4800 Baud then x = 006
If 9600 Baud then x = 006

* If 110 baud has been selected the frame gap time must be keyed in via the numeric keys. Standard frame gap time for 110 baud is 200mS.

The frame gap time is accepted by pressing the **[enter]** key.

The display will now show **"SEL. Eto. yyy"**, where **"yyy"** indicates the "extra timeout time".

A unit in the remote control system expects to receive the first byte in an answering frame within the timeout time. The timeout time is normally 1 second (**yyy** = 0). Using program 20 the timeout time can be changed. The total timeout time is calculated as shown below:

Timeout time = (1 + 0.256 * yyy) sec.

Using the numeric keys the extra timeout time **"yyy"** can be selected between 0 and 255.

The extra timeout time is accepted by pressing the **[enter]** key.

The display will now show **"SEL. dEL. z"**, where **"z"** equals the RTS to TxD time. The normal time between raise of RTS line signal to TxD active is approximately 16 mS (if CTS is active). The RTS to TxD time can be increased by selecting **"z"** greater than 16mS. **"z"** can be selected between 0 and 255mS via the numeric keys. If **"z"** is selected below 16 the delay between RTS to TxD time will still equal 16mS.

The selected delay is accepted by pressing the **[enter]** key.

5.2.2 Remote Configurations

The different types of remote configurations are described in the following subsections.

5.2.2.1 RS232C Standard

Only one RX/SE4010 can be controlled directly from the RCU (Remote Control Unit), when using the RS232C (V.24) standard. The RCU may consist of a RC/TC4010 or a remote computer. The RX/SE4010 must have a unique address in the interval 01 to 31. If more than one is to be controlled, a line sharing unit must be placed between the RCU and the RX/SE4010. Note that the cable must be screened and that cable length of more than 25 m cannot be recommended unless a low baudrate is acceptable.

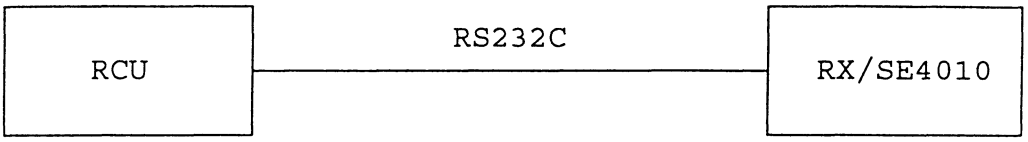


Figure 5.2

5.2.2.2 RS422 Standard

A maximum of 10 RX/SE4010's can be controlled from the RCU (Remote Control Unit), when using the RS422 standard. The RCU may consist of a RC/TC4010 or a remote computer. The RX/SE4010 must have a unique address in the interval 01 to 31. Cable must be screened and twisted and a terminating resistor of approx. 470 ohms should be mounted across each pair in the far end of the cable. Cable length should be limited to approx. 250 m depending on selected baudrate and environmental conditions such as EMC.

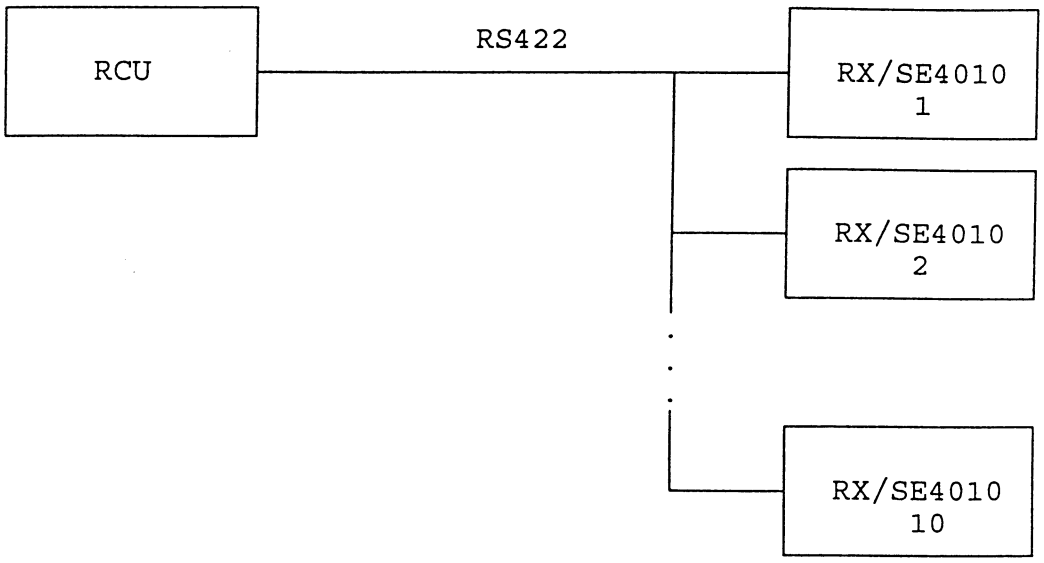


Figure 5.3

5.2.2.3 RS485 Standard

A maximum of 31 RX/SE4010's and 31 RCU's can be connected when using the RS485 standard. All RX/SE4010's and RCU's must have a unique address in the interval 01 to 31 (The RCU with address 31 is called the master controller). The RCU may consist of a RC/TC4010 or a remote computer.

The line must be a screened twisted-pair line terminated in 100 ohms at both ends of the cable. The line must only be loaded with these two 100 ohms resistors. Line B (pin 24) must be connected to ground by a 1 Kohms resister at one location of the line. This is shown on Figure 5.4 below.

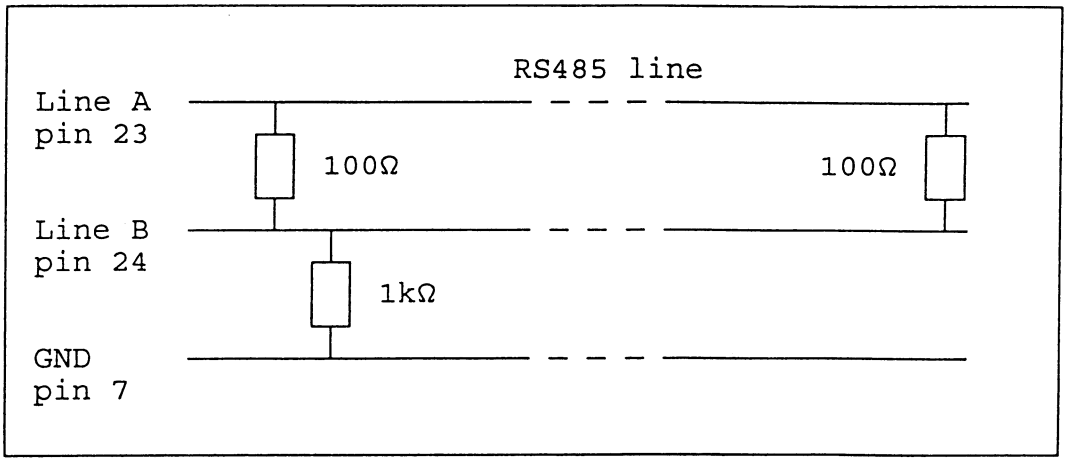


Figure 5.4 Termination of RS485 line

Depending on baudrate and environmental conditions such as EMC, cable length should be limited to approx. 500 m. The network can be established as shown in the following examples, Figure 5.5 to Figure 5.7.

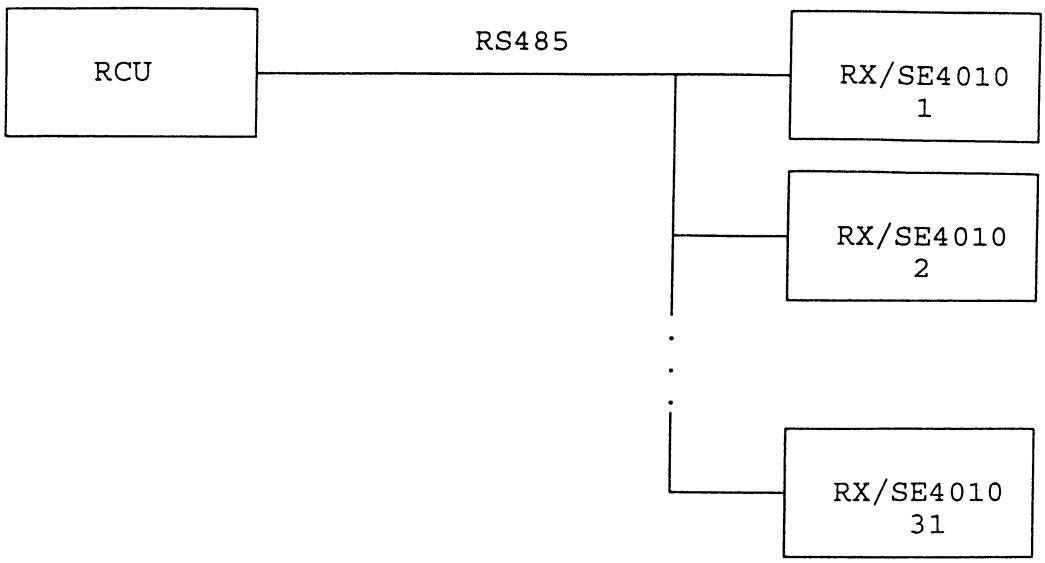


Figure 5.5

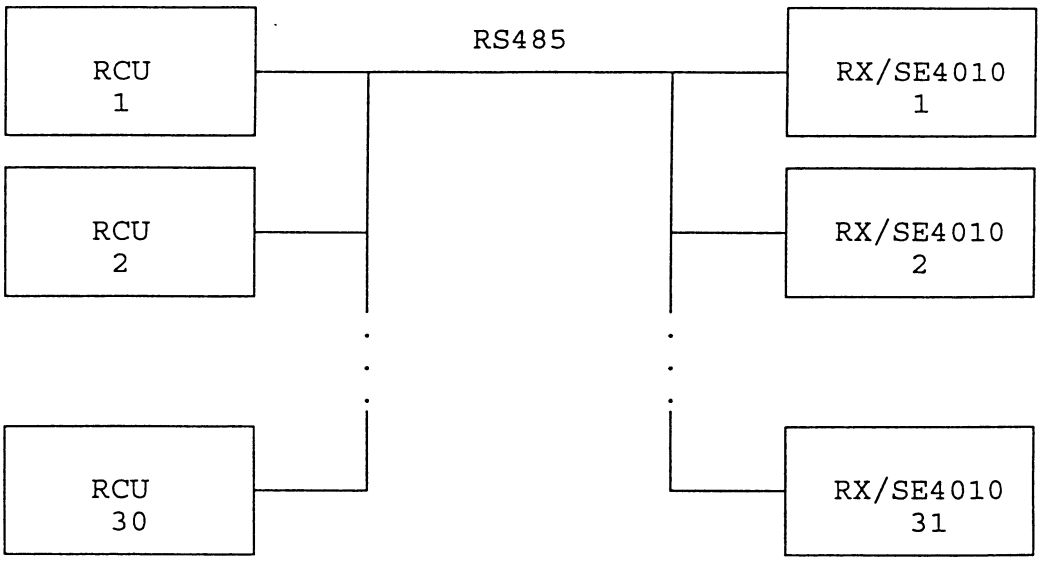


Figure 5.6

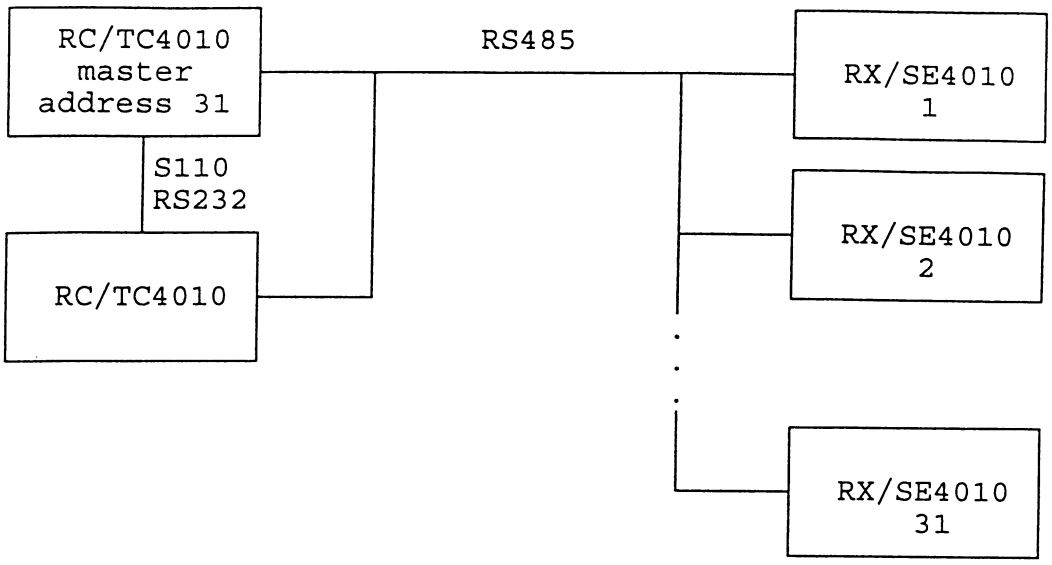


Figure 5.7

The master RC/TC4010 uses the S110/RS232 connection of the A8 module in order to take over the command at any time. Cable length between the two controllers should be limited to 100 m. Screened cable is recommended.

5.2.2.4 Remote Control via Modem

Up to 31 RX/SE4010's can be controlled from one RCU. The RCU may consist of a RC/TC4010 or a remote computer. Each RX/SE4010 must have a unique address in the interval 01 to 31.

If an external modem with RS232 interface is used, a Line Sharing Unit or a RS232/RS485 converter must be added between the modem and the RX/SE4010. In this way it is possible to connect the RX/SE4010's to the same modem. This is shown in Figure 5.8 and 5.9.

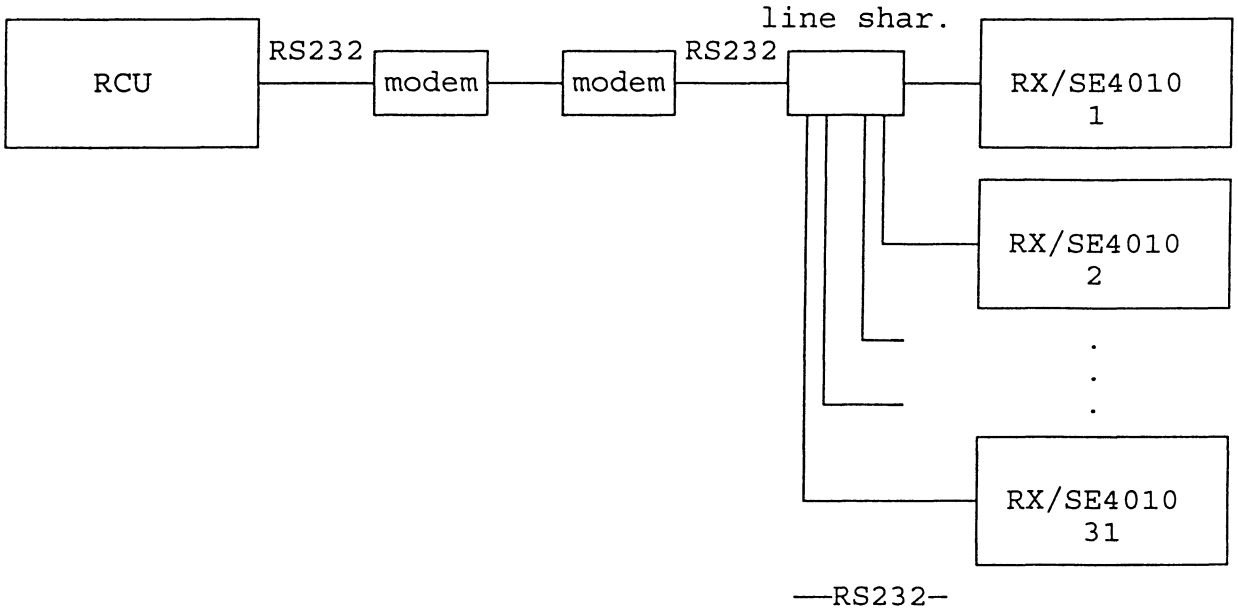


Figure 5.8

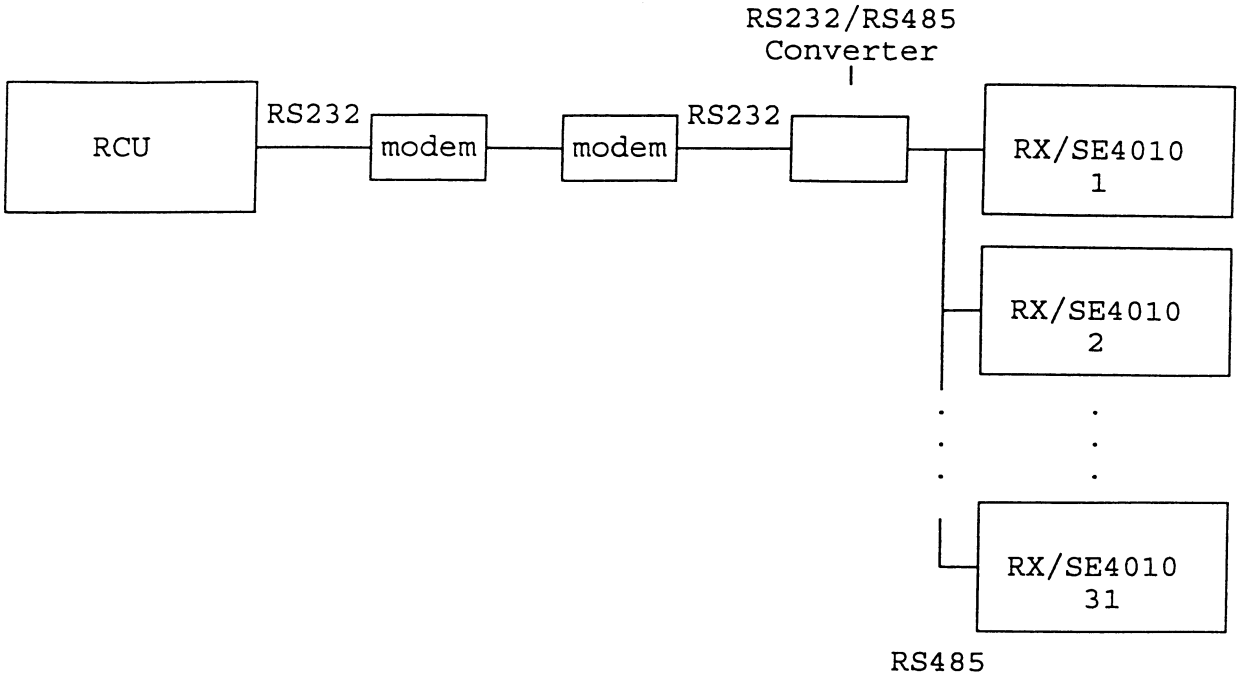


Figure 5.9

5.2.3 Strapping

This subsection describes how to strap the Standard Remote Interface A9, No. 490598.

Selection of baud rate and interface type must be carried out by strapping of the assembly as shown in table 5.10 and 5.11. For location of straps please refer to Section 8.

Table 5.10 Baudrate selection

baudrate	straps
75	3-9
110	3-9,1-2
150	3-8
300	3-9
600	3-8

baudrate	straps
1200	3-7
2400	3-6
4800	3-5
9600	3-4

Table 5.11 Selection of interface type

type	straps	S1f
RS232C with control signals 1)	11-12,13-15,19-20	on
RS232C with control signals 2)	11-12,13-15,19-20	off
RS232C without control signals	10-11,13-14,19-20	off
RS422 without control signals	10-11,13-14,19-21,22-23 24-25,26-27,28-29	off
RS485 without control signals	10-11,13-14,16-17, 19-21,22-23,24-25	off

Notes: 1) Control signals: CTS, RTS, DTR, DCD (DSR)
2) Control signals: CTS, RTS, DTR, DSR.

When using control signals it is recommended to use the case with S1f = on. In this case DSR (pin 6) will be interpreted as DCD.

The remote address must be selected individually for each unit in the remote control system. Table 5.12 shows how to strap the remote unit address of the assembly.

Table 5.12 Selection of remote unit address

S1	off switch value	on switch value
a	1	0
b	2	0
c	4	0
d	8	0
e	16	0

The remote unit address is the sum of the switches.
Example: Strapping of the assembly to address 21.

Switch a, c and e must be OFF and switch b and d must be ON.

Example: Strapping of the assembly to address 7.

Switch a, b and c must be OFF and switch d and e must be ON.

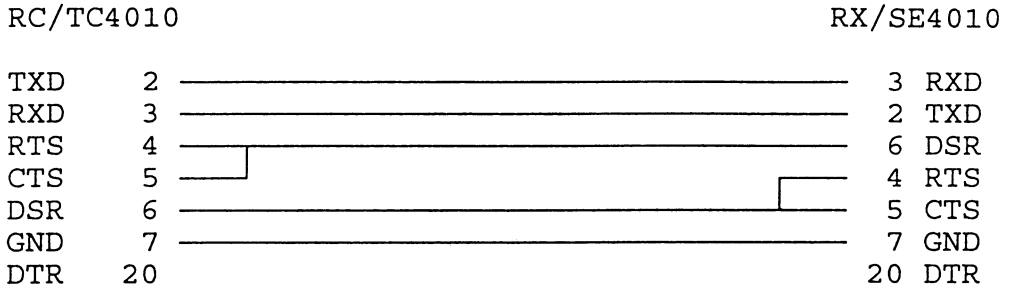
The address must not be set to 0!

5.2.4 Connections

The following subsection describes the connections between the units in the remote system. For identification of pin numbers of the connector please refer to Section 2.

5.2.4.1 RS232C Control via RC4010/TC4010

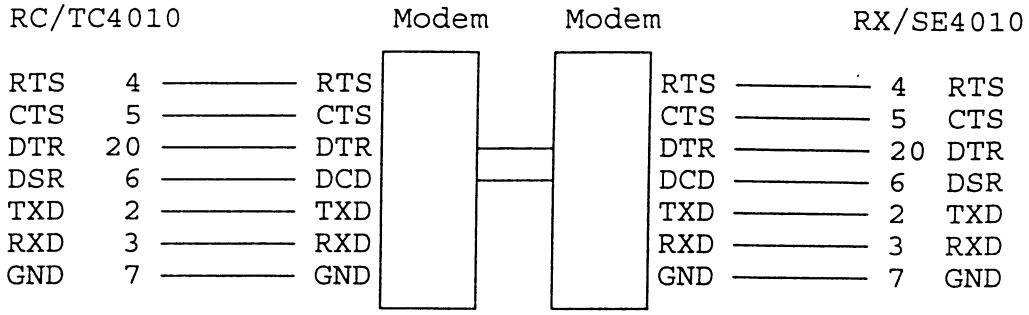
The RS232 remote control of a RX/SE4010 via a RC/TC4010 without modem is shown in Figure 5.13.



Notes: 1. The DSR signal is interpreted as a DCD signal (S1f = on).
2. DTR is not used.
3. The RTS and CTS is internally connected via a strap.

Figure 5.13

The RS232 remote control of a RX/SE4010 via a RC/TC4010 with modem is shown in Figure 5.14.



Notes: 1. The DSR signal is interpreted as a DCD signal (S1f = on).

Figure 5.14

If the used modem does not incorporate the "DCD" signal, the DSR signal of the modem should be connected to "DSR" of the Standard Remote Interface and S1f must be strapped to "off".

5.2.4.2 RS232 Control via Remote Computer

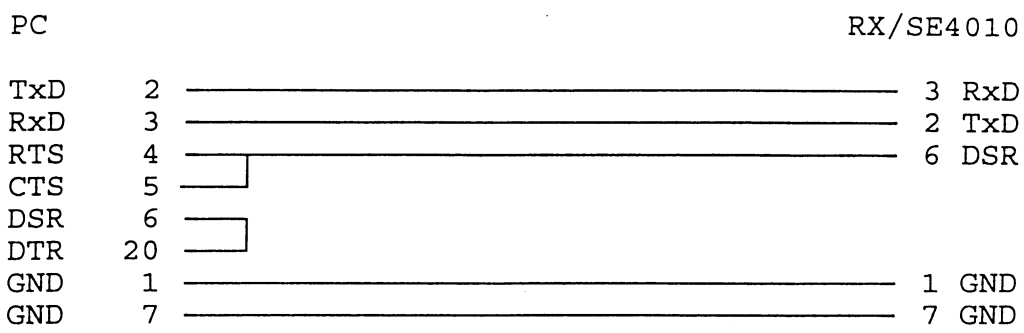
The remote computer for control of RX/SE4010 may consist of a Personal Computer (PC) with a serial RS232 communication port.

In order to control a RX/SE4010 via a remote computer three tasks must be carried out:

- Cable interfacing between remote computer and Standard Remote Interface A9.
- Strapping of the Standard Remote Interface A9.
- Selection of baudrate and communication setups via program 20.

The rest of this subsection describes an example of remote control via a PC. The following serial data format is used: 8 databits, 1 stopbit, no parity, baudrate = 9600, unit address is 1, and DSR signal on the RC/TC4010 is used as DCD.

The cable interface between the PC and the Standard Remote Interface A9 is shown in figure 5.15.



Notes: 1. The pin numbers for the PC is valid for a standard RS232 serial port with 25 pin sub-D connector.

2. The pin numbers for the RX/SE4010 is valid for J1 on the Standard Remote Interface Assembly!

Figure 5.15

Strapping of the Standard Remote Interface A9 is shown in figure 5.16.

type	straps
RS232C with RTS int. gated to CTS, 9600 baud	3-4, 11-12, 13-14, 19-20

Strap S1: A off
B on
C on
D on
E on
F on

Figure 5.16

Selection of baudrate and communication setups via program 20 is shown in figure 5.17.

baudrate	Stop bit	Parity	Frame gap	Eto.	dEL.
9600	1	OFF	9	0	0

Figure 5.17

5.3 Audio Connection

The following subsections describes the audio and key connections.

5.3.1 Audio Connection between RX4010 and RC4010

Figure 5.18 shows the audio and data connections between RX4010 and RC4010.

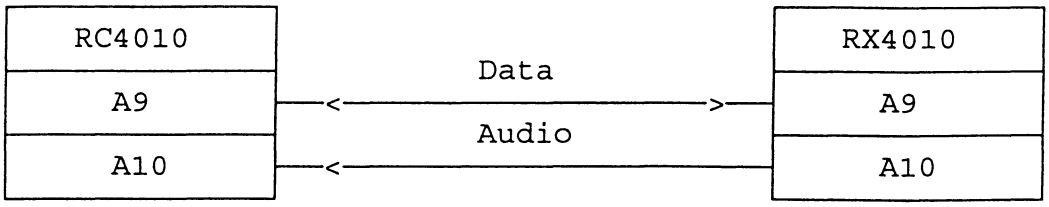


Figure 5.18

The audio connection may be obtained direct or via a two wire telephone line for each audio channel. Two AF lines are required for ISB reception.

When an RC4010 controls more than one receiver and monitoring of the audio channels is wanted, optional 8-line Monitor Modules can be installed in the RC4010. Each 8-line Monitor Module contains eight audio channels for four RX4010's.

5.3.2 Audio and Key Connection between TC4010 and SE4010

Figure 5.19 shows connections between TC4010 and SE4010 when the audio and key signals are transferred via telephone lines.

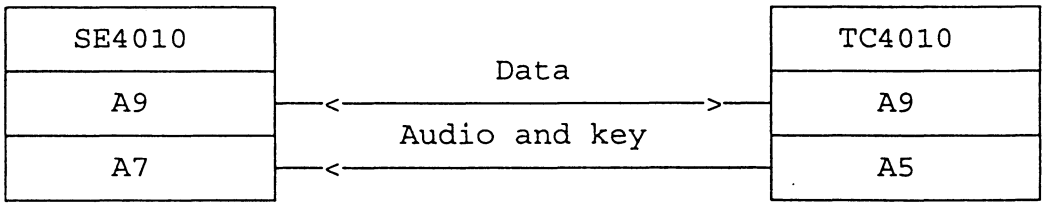


Figure 5.19

To obtain the audio and key inputs for SE4010 at the TC4010 site, optional Audio and Key Modules can be installed in the TC4010 and the SE4010. These modules enables transmission of combined audio and key signals on a two wire telephone line for each audio

channel. Up to five Audio and Key Modules can be installed in one TC4010. Each module contains two audio and key channels for one SE4010.

The audio and key connections may also be obtained directly without the A5 assembly of TC4010.

5.4 Serial Errors

If the display shows **"SEr. OFFLInE"** this indicates that the serial line is off. The master will then go into "off serial" mode.

6 REPLACEABLE PARTS

6.1 Introduction

This section contains information for ordering parts.

6.2 Replaceable Parts List

The following pages contain parts lists of the assemblies. The parts are listed in order of part number of the assemblies.

To order a part listed in the parts lists, quote the quantity and the part number of the wanted part and address the order to:

Dansk Radio Comm. ApS
Valbyvej 20
2630 Taastrup
Denmark

Telephone : +45 43 71 60 45
Fax: +45 43 71 45 04

If the wanted part is a component in an assembly which is not produced by Dansk Radio, please also inform about the name of the external producer.

To order a part that is not listed in the parts lists, please inform about the equipment model number, equipment serial number and function of the part.

PARTSLIST

Printed: 1999-02-10

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	60	BR471941	8-LINE MONITOR A5	A5
2	1	ST	60	BR487740	MICROCOMPUTER ASSY A8 RT	A8
4	1	ST	61	BR471720	POWER SUPPLY ASSY A10 220	A10
5	1	ST	60	BR495131	FRONT PANEL RC4010 A11	A11
6	1	ST	41	BR476056	CHASSIS ASSY A12 RC40..	A12
7	4	ST	51	BR327301	SCREW M 5 X20 CHM CU SN	H1
8	4	ST	51	BR327255	SCREW M 4 X16 CHM CU SN	H2
9	40	ST	51	232495-011	SCREW M 3 X 8 TP.POZIDR.A2	H3
10	4	ST	51	232495-011	SCREW M 3 X 8 TP.POZIDR.A2	H4
11	4	ST	53	BR321966	WASHER FLAT Ø 5MM CU SN	H5
12	5	ST	41	BR445991	REAR PLATE DUMMY 1M	MP1
13	1	ST	41	BR475149	REAR PLATE DUMMY 1,5M	MP2
15	1	ST	60	BR475076	KIT,SPARES RX/RC RUNNING	
18	1	ST	60	BR490598	INTERF. RS232 422/485 A9	
19	1	ST	48	221391-011	LABEL, SILVER 25.4X12.7MM	
20	1	ST	48	BR464872	LABEL, DRA TYPE/SER.NO	
22	0,200	ST	48	210757-001	LABELS FOR A10	
23	2	ST	60	BR495980	KIT, SUB-D CONN 15P MALE	
24	1	ST	32	229330-002	CABLE ASSEMBLY, POWER/GR	
25	1	ST	60	BR496014	KIT, SUB-D CONN 25P MALE	

BR495123-001 RC4010 INCL. A5,A9 490598

Dansk Radio Comm ApS

PARTSLIST

Printed: 1999-02-10

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	37	BR471933	PWB 8-LINE MO.	
2	11	ST	22	200514-204	CAP. CER 100N / 50K	C3
	11	ST	22	200514-204	CAP. CER 100N / 50K	C2
	11	ST	22	200514-204	CAP. CER 100N / 50K	C4
	11	ST	22	200514-204	CAP. CER 100N / 50K	C53
	11	ST	22	200514-204	CAP. CER 100N / 50K	C13
	11	ST	22	200514-204	CAP. CER 100N / 50K	C1
	11	ST	22	200514-204	CAP. CER 100N / 50K	C14
	11	ST	22	200514-204	CAP. CER 100N / 50K	C16
	11	ST	22	200514-204	CAP. CER 100N / 50K	C17
	11	ST	22	200514-204	CAP. CER 100N / 50K	C52
	11	ST	22	200514-204	CAP. CER 100N / 50K	C15
3	6	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C55
	6	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C7
	6	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C5
	6	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C19
	6	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C54
	6	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C6
4	1	ST	22	BR446254	CAP. POLYPRO. 5N6 / 160 F	C8
5	1	ST	22	200327-068	CAP. POLYPRO. 33N / 63 F	C9
6	1	ST	22	200327-011	CAP. POLYPRO. 120P / 630 F	C10
7	1	ST	22	200327-050	CAP. POLYPRO. 5N1 / 160 F	C11
8	1	ST	22	200327-031	CAP. POLYPRO. 820P / 630 F	C12
9	1	ST	22	202542-012	CAP. CER. 33P / 100G	C18
10	16	ST	22	BR202991	CAP. PLST 220N 100 K	C51
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C27
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C40
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C43
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C44
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C36
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C47
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C39
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C20
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C48
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C32
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C28
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C24
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C23
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C31
	16	ST	22	BR202991	CAP. PLST 220N 100 K	C35
11	16	ST	22	BR450863	CAP. PLST 10N 400 J	C21
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C22
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C41
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C42
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C46
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C50
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C45

BR471941 8-LINE MONITOR A5

PARTSLIST

Printed: 1999-02-10

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
11	16	ST	22	BR450863	CAP. PLST 10N 400 J	C34
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C33
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C30
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C26
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C25
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C49
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C38
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C29
	16	ST	22	BR450863	CAP. PLST 10N 400 J	C37
12	32	ST	23	200352-001	DIODE 1N4148	CR30
	32	ST	23	200352-001	DIODE 1N4148	CR6
	32	ST	23	200352-001	DIODE 1N4148	CR3
	32	ST	23	200352-001	DIODE 1N4148	CR4
	32	ST	23	200352-001	DIODE 1N4148	CR9
	32	ST	23	200352-001	DIODE 1N4148	CR2
	32	ST	23	200352-001	DIODE 1N4148	CR10
	32	ST	23	200352-001	DIODE 1N4148	CR29
	32	ST	23	200352-001	DIODE 1N4148	CR11
	32	ST	23	200352-001	DIODE 1N4148	CR31
	32	ST	23	200352-001	DIODE 1N4148	CR18
	32	ST	23	200352-001	DIODE 1N4148	CR7
	32	ST	23	200352-001	DIODE 1N4148	CR1
	32	ST	23	200352-001	DIODE 1N4148	CR25
	32	ST	23	200352-001	DIODE 1N4148	CR24
	32	ST	23	200352-001	DIODE 1N4148	CR8
	32	ST	23	200352-001	DIODE 1N4148	CR26
	32	ST	23	200352-001	DIODE 1N4148	CR19
	32	ST	23	200352-001	DIODE 1N4148	CR20
	32	ST	23	200352-001	DIODE 1N4148	CR28
	32	ST	23	200352-001	DIODE 1N4148	CR21
	32	ST	23	200352-001	DIODE 1N4148	CR32
	32	ST	23	200352-001	DIODE 1N4148	CR5
	32	ST	23	200352-001	DIODE 1N4148	CR22
	32	ST	23	200352-001	DIODE 1N4148	CR12
	32	ST	23	200352-001	DIODE 1N4148	CR17
	32	ST	23	200352-001	DIODE 1N4148	CR16
	32	ST	23	200352-001	DIODE 1N4148	CR27
	32	ST	23	200352-001	DIODE 1N4148	CR15
	32	ST	23	200352-001	DIODE 1N4148	CR14
	32	ST	23	200352-001	DIODE 1N4148	CR13
	32	ST	23	200352-001	DIODE 1N4148	CR23
13	5	ST	51	202185-003	SCREW M 2.5X 5 SLTD. CYL. BR	H1
14	1	ST	31	212654-023	CONN D 25 S/PCB ANGLE	J1
15	1	ST	31	212654-022	CONN D 15 S/PCB ANGLE	J2
16	3	ST	25	200730-003	COIL,RF	L1
	3	ST	25	200730-003	COIL,RF	L3
	3	ST	25	200730-003	COIL,RF	L2

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
17	1	ST	41	BR476072	REAR PLATE A 5 RC4000	MP1
18	1	ST	45	210840-001	RETAINER	MP2
19	2	ST	51	210841-001	THUMBSCREW	MP3
20	8	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q2
	8	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q8
	8	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q5
	8	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q1
	8	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q6
	8	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q7
	8	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q4
	8	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q3
21	3	ST	21	600004-085	RES CARB. 3K3, 0.5J	R55
	3	ST	21	600004-085	RES CARB. 3K3, 0.5J	R59
	3	ST	21	600004-085	RES CARB. 3K3, 0.5J	R1
22	1	ST	21	206088-017	RES NETW 9 X 10K 1/5G	R2
23	2	ST	21	203237-026	RES NETW 8 X 15K 1/4G	R4
	2	ST	21	203237-026	RES NETW 8 X 15K 1/4G	R3
24	1	ST	21	206088-018	RES NETW 9 X 47K 1/8M	R5
25	1	ST	21	600004-041	RES CARB. 47R, 0.5J	R6
26	3	ST	21	600005-338	RES FILM 24K3 / 0.6F	R7
	3	ST	21	600005-338	RES FILM 24K3 / 0.6F	R8
	3	ST	21	600005-338	RES FILM 24K3 / 0.6F	R9
27	4	ST	21	600004-097	RES CARB. 10K, 0.5J	R56
	4	ST	21	600004-097	RES CARB. 10K, 0.5J	R11
	4	ST	21	600004-097	RES CARB. 10K, 0.5J	R10
	4	ST	21	600004-097	RES CARB. 10K, 0.5J	R57
28	1	ST	21	600004-068	RES CARB. 620R, 0.5J	R12
29	2	ST	21	600004-113	RES CARB. 47K, 0.5J	R13
	2	ST	21	600004-113	RES CARB. 47K, 0.5J	R14
30	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R15
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R17
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R32
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R52
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R27
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R30
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R40
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R35
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R37
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R20
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R47
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R22
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R50
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R45
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R25
	16	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R42
31	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R41
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R38

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
31	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R43
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R46
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R31
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R51
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R36
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R16
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R48
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R28
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R53
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R26
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R23
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R18
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R33
	16	ST	21	600004-087	RES CARB. 3K9, 0.5J	R21
32	8	ST	21	229324-030	RES FILM 560R / 2.0 J	R29
	8	ST	21	229324-030	RES FILM 560R / 2.0 J	R19
	8	ST	21	229324-030	RES FILM 560R / 2.0 J	R54
	8	ST	21	229324-030	RES FILM 560R / 2.0 J	R24
	8	ST	21	229324-030	RES FILM 560R / 2.0 J	R49
	8	ST	21	229324-030	RES FILM 560R / 2.0 J	R34
	8	ST	21	229324-030	RES FILM 560R / 2.0 J	R44
	8	ST	21	229324-030	RES FILM 560R / 2.0 J	R39
33	1	ST	21	600004-102	RES CARB. 16K, 0.5J	R58
34	2	ST	21	600004-121	RES CARB. 100K, 0.5J	R61
	2	ST	21	600004-121	RES CARB. 100K, 0.5J	R60
35	2	ST	33	BR471798	SWITCH, PCP DIP-FIX 8X ON/OF	S8
	2	ST	33	BR471798	SWITCH, PCP DIP-FIX 8X ON/OF	S2
	2	ST	33	BR471798	SWITCH, PCP DIP-FIX 8X ON/OF	S6
	2	ST	33	BR471798	SWITCH, PCP DIP-FIX 8X ON/OF	S7
	2	ST	33	BR471798	SWITCH, PCP DIP-FIX 8X ON/OF	S5
	2	ST	33	BR471798	SWITCH, PCP DIP-FIX 8X ON/OF	S4
	2	ST	33	BR471798	SWITCH, PCP DIP-FIX 8X ON/OF	S3
	2	ST	33	BR471798	SWITCH, PCP DIP-FIX 8X ON/OF	S1
	2	ST	33	BR471798	SWITCH, PCP DIP-FIX 8X ON/OF	S9
	2	ST	33	BR471798	SWITCH, PCP DIP-FIX 8X ON/OF	S10
36	1	ST	25	BR373206	TRAFO,LINE 600:600R	T1
37	1	ST	24	200886-006	IC, --74 45N BCD-DECIMA	U1
38	1	ST	24	206072-095	IC, --74HCT138, DECODER	U2
39	1	ST	24	235049-026	IC, --74LS377N 8X D-FF	U3
40	1	ST	24	236675-002	IC, TL084, OP AMP. QUAD	U4
41	1	ST	24	203469-006	IC, --74 06N	U5
42	5	ST	24	211620-002	IC, --4066BC, 6XANALOG SWIT	U7
	5	ST	24	211620-002	IC, --4066BC, 6XANALOG SWIT	U9
	5	ST	24	211620-002	IC, --4066BC, 6XANALOG SWIT	U10
	5	ST	24	211620-002	IC, --4066BC, 6XANALOG SWIT	U8
	5	ST	24	211620-002	IC, --4066BC, 6XANALOG SWIT	U6
43	2	ST	31	222836-140	CONN D ACCESS. JACK SOCKT	

BR471941 8-LINE MONITOR A5

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	37	BR487848	PWB,MICROCOMP.RTC A8	
2	1	ST	20	BR391921	BATTERY 3V LITHIUM	BT1
3	2	ST	22	BR459410	CAP. ELEC 10U / 10 M	C1
	2	ST	22	BR459410	CAP. ELEC 10U / 10 M	C47
4	1	ST	22	BR451339	CAP. ELEC 15U / 10 M	C2
5	1	ST	22	BR357650	CAP. CER. 22N 63 A HI-K	C3
6	1	ST	22	BR437395	CAP. CER. 220P 100 G N750	C4
7	6	ST	22	BR450510	CAP. CER. 100N 63 S	C54
	6	ST	22	BR450510	CAP. CER. 100N 63 S	C5
	6	ST	22	BR450510	CAP. CER. 100N 63 S	C7
	6	ST	22	BR450510	CAP. CER. 100N 63 S	C6
	6	ST	22	BR450510	CAP. CER. 100N 63 S	C28
	6	ST	22	BR450510	CAP. CER. 100N 63 S	C52
8	3	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	C9
	3	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	C15
	3	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	C11
9	1	ST	22	221220-004	CAP. PLAST 33N / 63K	C10
10	1	ST	22	BR349070	CAP. PLST 680N 100 K	C12
11	1	ST	22	BR202991	CAP. PLST 220N 100 K	C13
12	1	ST	22	BR454117	CAP. PLST 68N 250 K	C14
13	3	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C16
	3	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C17
	3	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C18
14	1	ST	22	BR357634	CAP. CER. 2N2 100 K HI-K	C42
15	3	ST	23	BR228001	DIO SCHOT BAT 85 SI 200MA	CR19
	3	ST	23	BR228001	DIO SCHOT BAT 85 SI 200MA	CR1
	3	ST	23	BR228001	DIO SCHOT BAT 85 SI 200MA	CR11
16	9	ST	23	200352-001	DIODE 1N4148	CR4
	9	ST	23	200352-001	DIODE 1N4148	CR5
	9	ST	23	200352-001	DIODE 1N4148	CR6
	9	ST	23	200352-001	DIODE 1N4148	CR7
	9	ST	23	200352-001	DIODE 1N4148	CR9
	9	ST	23	200352-001	DIODE 1N4148	CR14
	9	ST	23	200352-001	DIODE 1N4148	CR8
	9	ST	23	200352-001	DIODE 1N4148	CR12
	9	ST	23	200352-001	DIODE 1N4148	CR10
17	10	mm	34	222837-004	TAPE, DOUBLE-SIDED 1.6MM	
18	1	ST	23	BR328324	DIO SIGN. AAZ 15 GE 140MA	CR23
19	5	ST	51	202185-003	SCREW M 2.5X 5 SLTD. CYL. BR	H1
20	4	ST	31	222836-140	CONN D ACCESS. JACK SOCKT	H2
21	5	ST	26	BR392707	TRANS.ACCESS PAD TO-18	H3
23	1	ST	45	201197-049	STRAP, CABLE, NAT Ø20X2.5	H6
25	3	ST	25	200730-003	COIL,RF	L3
	3	ST	25	200730-003	COIL,RF	L2
	3	ST	25	200730-003	COIL,RF	L1
26	1	ST	41	BR489808	REAR PLATE A8 MICROC.RTC	MP1
27	1	ST	45	210840-001	RETAINER	MP2

BR487740 MICROCOMPUTER ASSY A8 RTC

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
28	2	ST	51	210841-001	THUMBSCREW	MP3
29	3	ST	26	BR392820	TRANS.LOPOW 2N2222A SI-N	Q2
	3	ST	26	BR392820	TRANS.LOPOW 2N2222A SI-N	Q3
	3	ST	26	BR392820	TRANS.LOPOW 2N2222A SI-N	Q1
30	1	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q8
31	1	ST	26	BR273910	TRANS.LOPOW BC 177 SI-P T	Q9
32	1	ST	26	BR392839	TRANS.LOPOW 2N2907A SI-P	Q11
33	1	ST	21	600004-081	RES CARB. 2K2, 0.5J	R1
34	3	ST	21	600004-121	RES CARB. 100K, 0.5J	R2
	3	ST	21	600004-121	RES CARB. 100K, 0.5J	R78
	3	ST	21	600004-121	RES CARB. 100K, 0.5J	R3
35	1	ST	21	600004-125	RES CARB. 150K, 0.5J	R4
36	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R5
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R10
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R11
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R12
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R13
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R19
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R21
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R7
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R36
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R34
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R49
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R42
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R27
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R25
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R89
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R88
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R33
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R103
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R39
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R51
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R98
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R40
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R97
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R48
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R35
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R99
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R47
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R41
	29	ST	21	600004-073	RES CARB. 1K0, 0.5J	R82
37	3	ST	21	600004-104	RES CARB. 20K, 0.5J	R59
	3	ST	21	600004-104	RES CARB. 20K, 0.5J	R6
	3	ST	21	600004-104	RES CARB. 20K, 0.5J	R62
38	2	ST	21	600004-114	RES CARB. 51K, 0.5J	R9
	2	ST	21	600004-114	RES CARB. 51K, 0.5J	R8
39	4	ST	21	600004-089	RES CARB. 4K7, 0.5J	R71

BR487740 MICROCOMPUTER ASSY A8 RTC

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
39	4	ST	21	600004-089	RES CARB. 4K7, 0.5J	R102
	4	ST	21	600004-089	RES CARB. 4K7, 0.5J	R14
	4	ST	21	600004-089	RES CARB. 4K7, 0.5J	R15
40	6	ST	21	BR241458	RES CARB. 1K0 1/2JSFR25H	R23
	6	ST	21	BR241458	RES CARB. 1K0 1/2JSFR25H	R29
	6	ST	21	BR241458	RES CARB. 1K0 1/2JSFR25H	R22
	6	ST	21	BR241458	RES CARB. 1K0 1/2JSFR25H	R17
	6	ST	21	BR241458	RES CARB. 1K0 1/2JSFR25H	R28
	6	ST	21	BR241458	RES CARB. 1K0 1/2JSFR25H	R16
41	3	ST	21	600004-055	RES CARB. 180R, 0.5J	R24
	3	ST	21	600004-055	RES CARB. 180R, 0.5J	R18
	3	ST	21	600004-055	RES CARB. 180R, 0.5J	R30
42	3	ST	21	600004-087	RES CARB. 3K9, 0.5J	R32
	3	ST	21	600004-087	RES CARB. 3K9, 0.5J	R26
	3	ST	21	600004-087	RES CARB. 3K9, 0.5J	R20
44	2	ST	21	600004-090	RES CARB. 5K1, 0.5J	R66
	2	ST	21	600004-090	RES CARB. 5K1, 0.5J	R64
45	6	ST	21	600004-097	RES CARB. 10K, 0.5J	R65
	6	ST	21	600004-097	RES CARB. 10K, 0.5J	R77
	6	ST	21	600004-097	RES CARB. 10K, 0.5J	R79
	6	ST	21	600004-097	RES CARB. 10K, 0.5J	R81
	6	ST	21	600004-097	RES CARB. 10K, 0.5J	R83
	6	ST	21	600004-097	RES CARB. 10K, 0.5J	R96
46	1	ST	21	BR391093	RES VAR 20K 1/2K CERM	R67
47	7	ST	21	235004-115	RES FILM 56K / 0.4 J	R86
	7	ST	21	235004-115	RES FILM 56K / 0.4 J	R84
	7	ST	21	235004-115	RES FILM 56K / 0.4 J	R73
	7	ST	21	235004-115	RES FILM 56K / 0.4 J	R68
	7	ST	21	235004-115	RES FILM 56K / 0.4 J	R87
	7	ST	21	235004-115	RES FILM 56K / 0.4 J	R93
	7	ST	21	235004-115	RES FILM 56K / 0.4 J	R72
48	1	ST	21	600004-145	RES CARB. 1M0, 0.5J	R69
49	1	ST	21	600004-099	RES CARB. 12K, 0.5J	R70
51	2	ST	21	600004-063	RES CARB. 390R, 0.5J	R75
	2	ST	21	600004-063	RES CARB. 390R, 0.5J	R95
52	1	ST	21	600004-101	RES CARB. 15K, 0.5J	R80
53	2	ST	21	600004-080	RES CARB. 2K0, 0.5J	R90
	2	ST	21	600004-080	RES CARB. 2K0, 0.5J	R85
54	1	ST	21	600004-131	RES CARB. 270K, 0.5J	R100
55	1	ST	21	600004-088	RES CARB. 4K3, 0.5J	R101
57	1	ST	24	230988-002	IC, --80C85	U1
58	1	ST	24	200499-095	IC, --74HCT123 2XMONOST	U2
59	3	ST	24	200464-095	IC, --74HCT 04, HEX INVERT	U3
	3	ST	24	200464-095	IC, --74HCT 04, HEX INVERT	U5
	3	ST	24	200464-095	IC, --74HCT 04, HEX INVERT	U10
60	1	ST	24	203927-095	IC, --74HCT 14, INVERTERS	U4
61	4	ST	24	203469-006	IC, --74 06N	U37

BR487740 MICROCOMPUTER ASSY A8 RTC

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
61	4	ST	24	203469-006	IC, --74 06N	U6
	4	ST	24	203469-006	IC, --74 06N	U56
	4	ST	24	203469-006	IC, --74 06N	U47
62	1	ST	24	200466-095	IC, --74HCT 08, AND GATES	U7
63	2	ST	24	200462-095	IC, --74HCT 00, NAND GATE	U8
	2	ST	24	200462-095	IC, --74HCT 00, NAND GATE	U15
64	4	ST	24	213541-095	IC, --74HCT161E	U39
	4	ST	24	213541-095	IC, --74HCT161E	U38
	4	ST	24	213541-095	IC, --74HCT161E	U40
	4	ST	24	213541-095	IC, --74HCT161E	U9
65	2	ST	24	200497-095	IC, --74HCT 32, OR	U20
	2	ST	24	200497-095	IC, --74HCT 32, OR	U11
66	1	ST	24	213289-026	IC, --74LS373N 8X D LAT	U12
67	1	ST	24	207749-026	IC, --74LS365N 6X BUSDR	U13
68	2	ST	24	200888-095	IC, --74HCT 74, 2X D FF	U14
	2	ST	24	200888-095	IC, --74HCT 74, 2X D FF	U28
69	2	ST	24	211115-026	IC, --74LS240N 8X BUF.I	U41
	2	ST	24	211115-026	IC, --74LS240N 8X BUF.I	U16
70	2	ST	24	207432-026	IC, --74LS245N	U27
	2	ST	24	207432-026	IC, --74LS245N	U17
71	1	ST	24	203515-095	IC, --74HCT 11 3X3IN AN	U18
72	2	ST	24	206072-095	IC, --74HCT138, DECODER	U19
	2	ST	24	206072-095	IC, --74HCT138, DECODER	U21
73	2	ST	24	204494-095	IC, --74HCT 21 4X2IN AN	U22
	2	ST	24	204494-095	IC, --74HCT 21 4X2IN AN	U48
74	1	ST	24	BR487503	IC, --62421B RT CLOCK	U26
75	3	ST	24	200498-006	IC, --74 37N 4X2IN NAND	U31
	3	ST	24	200498-006	IC, --74 37N 4X2IN NAND	U29
	3	ST	24	200498-006	IC, --74 37N 4X2IN NAND	U30
76	1	ST	24	208798-001	IC, --1488L 4XLINEDRIV	U32
77	1	ST	24	208799-001	IC, --75189AJ, LINE RECEIVER	U33
78	3	ST	24	BR433632	IC, MCA 255 OPTO ISOL	U34
	3	ST	24	BR433632	IC, MCA 255 OPTO ISOL	U35
	3	ST	24	BR433632	IC, MCA 255 OPTO ISOL	U36
79	1	ST	24	207659-095	IC, --74HCT259 8X LATCH	U42
80	1	ST	24	207437-095	IC, --74HCT374	U43
81	1	ST	24	235243-026	IC, --74LS145N BCD-DEC	U44
82	1	ST	24	213585-001	IC, SRAM 8KX8BIT	U46
83	1	ST	24	211617-002	IC, --4049B 6X INV-BUF	U49
84	1	ST	24	211608-002	IC, --4027A 2X JK FF	U50
85	1	ST	24	212010-004	IC, --4071B 4X2 INP OR	U51
86	1	ST	24	235049-026	IC, --74LS377N 8X D-FF	U52
87	1	ST	24	207485-002	IC, DAC08BC	U53
88	2	ST	24	BR450294	IC, TL 082CP OP.AMP.	U54
	2	ST	24	BR450294	IC, TL 082CP OP.AMP.	U55
89	2	ST	24	211620-002	IC, --4066BC, 6XANALOG SWIT	U58
	2	ST	24	211620-002	IC, --4066BC, 6XANALOG SWIT	U57

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
90	1	ST	24	BR455474	IC, LM3302N VOLT COMP	U59
91	2	ST	23	203527-009	DIODE ZENER 5V1 / 0.5W J	VR1
	2	ST	23	203527-009	DIODE ZENER 5V1 / 0.5W J	VR2
92	1	ST	23	203527-008	DIODE ZENER 4V7 / 0.5W J	VR3
94	1	ST	24	206133-008	SOCKET, 40PIN	XU1
95	5	ST	24	206133-007	SOCKET, 28PIN	XU24
	5	ST	24	206133-007	SOCKET, 28PIN	XU25
	5	ST	24	206133-007	SOCKET, 28PIN	XU45
	5	ST	24	206133-007	SOCKET, 28PIN	XU23
98	1	ST	20	BR433853	CRYSTAL 6,14400MHZ HC49-U	Y1
101	1	ST	21	206088-042	RES NETW 9 X 4K7 1/5G	R104
102	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C57
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C58
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C59
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C37
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C40
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C38
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C39
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C48
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C49
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C36
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C53
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C19
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C35
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C51
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C23
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C20
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C50
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C22
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C34
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C24
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C25
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C26
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C27
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C29
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C30
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C31
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C32
	28	ST	22	221220-007	CAP. PLAST 100N / 63K	C21
104	1	ST	31	212654-021	CONN D 9 S/PCB ANGLE	J2
105	1,56	ST	31	208801-001	CONN MINI-JUMP 36 PIN	TP16-29
	1,56	ST	31	208801-001	CONN MINI-JUMP 36 PIN	TP1-14
	1,56	ST	31	208801-001	CONN MINI-JUMP 36 PIN	S1-S7
108	1	ST	48	214073-004	LABEL, ADHESIVE, ESD	
109	0,08	M	32	200843-009	WIRE COP TIN-CTD Ø0.6MM	
110	7	ST	31	208802-002	CONN B-JUMP	

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	37	BR490563	PWB,INTERFACE RS232 422/485	
2	2	ST	22	BR454117	CAP. PLST 68N 250 K	C33
	2	ST	22	BR454117	CAP. PLST 68N 250 K	C1
3	7	ST	22	BR477176	CAP. CER. 330P 100 K	C4
	7	ST	22	BR477176	CAP. CER. 330P 100 K	C3
	7	ST	22	BR477176	CAP. CER. 330P 100 K	C2
	7	ST	22	BR477176	CAP. CER. 330P 100 K	C6
	7	ST	22	BR477176	CAP. CER. 330P 100 K	C7
	7	ST	22	BR477176	CAP. CER. 330P 100 K	C8
	7	ST	22	BR477176	CAP. CER. 330P 100 K	C5
4	3	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C9
	3	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C11
	3	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C13
5	19	ST	22	BR450510	CAP. CER. 100N 63 S	C20
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C25
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C26
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C23
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C27
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C28
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C36
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C22
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C10
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C12
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C29
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C21
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C24
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C14
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C15
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C16
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C17
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C18
	19	ST	22	BR450510	CAP. CER. 100N 63 S	C19
6	1	ST	22	BR437395	CAP. CER. 220P 100 G N750	C30
7	3	ST	22	202542-014	CAP. CER. 47P / 100G	C31
	3	ST	22	202542-014	CAP. CER. 47P / 100G	C35
	3	ST	22	202542-014	CAP. CER. 47P / 100G	C34
8	1	ST	22	BR451053	CAP. ELEC 68U / 6,3 M	C32
9	1	ST	23	200352-001	DIODE 1N4148	CR1
10	4	ST	51	202185-003	SCREW M 2.5X 5 SLTD. CYL. BR	H1
11	1	ST	31	222836-140	CONN D ACCESS. JACK SOCKT	H2
13	1	ST	31	212654-023	CONN D 25 S/PCB ANGLE	J1
14	3	ST	25	200730-003	COIL,RF	L3
	3	ST	25	200730-003	COIL,RF	L2
	3	ST	25	200730-003	COIL,RF	L1
15	1	ST	41	BR491829	REAR PLATE A9 INTERFACE	MP1
16	1	ST	45	210840-001	RETAINER	MP2
17	2	ST	51	210841-001	THUMBSCREW	MP3

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PARTSLIST

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
18	1	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q2
19	1	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q3
20	2	ST	21	600004-066	RES CARB. 510R, 0.5J	R10
	2	ST	21	600004-066	RES CARB. 510R, 0.5J	R1
21	1	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R2
22	2	ST	21	600004-071	RES CARB. 820R, 0.5J	R8
	2	ST	21	600004-071	RES CARB. 820R, 0.5J	R7
23	1	ST	21	600004-107	RES CARB. 27K, 0.5J	R11
24	1	ST	21	BR359165	RES VAR 10K 1/2K CERM	R12
25	1	ST	21	600004-075	RES CARB. 1K2, 0.5J	R13
26	1	ST	21	600004-105	RES CARB. 22K, 0.5J	R14
27	2	ST	21	600004-033	RES CARB. 22R, 0.5J	R16
	2	ST	21	600004-033	RES CARB. 22R, 0.5J	R15
28	2	ST	21	206088-001	RES NETW 7 X 10KOHM	R18
	2	ST	21	206088-001	RES NETW 7 X 10KOHM	R17
30	1	ST	25	BR362859	TRAFO,LINE 600:600R	T1
31	1	ST	24	200464-026	IC, --74LS 04N, 6XINV.	U1
32	1	ST	24	200488-026	IC, --74LS 90N DEC.COUNT	U2
33	2	ST	24	213541-095	IC, --74HCT161E	U4
	2	ST	24	213541-095	IC, --74HCT161E	U3
34	1	ST	24	207432-095	IC, --74HCT245E	U5
35	1	ST	24	206072-095	IC, --74HCT138, DECODER	U6
36	1	ST	24	200464-095	IC, --74HCT 04, HEX INVERT	U7
37	1	ST	24	200497-095	IC, --74HCT 32, OR	U8
38	1	ST	24	203469-006	IC, --74 06N	U9
39	1	ST	24	230989-002	IC, USARD, MSM82C51ARS	U10
40	1	ST	24	208798-001	IC, --1488L 4XLINEDRIV	U11
41	1	ST	24	208799-001	IC, --75189AJ, LINE RECEIVER	U12
42	1	ST	24	BR357707	IC, MC1458P OP.AMPL.	U13
43	1	ST	24	207749-095	IC, --74HCT365 6XBUSDRI	U14
44	2	ST	24	221579-001	IC, --75 176, TRANSCEIVER	U16
	2	ST	24	221579-001	IC, --75 176, TRANSCEIVER	U15
45	2	ST	23	203527-019	DIODE ZENER 13V0 / 0.5W J	VR3
	2	ST	23	203527-019	DIODE ZENER 13V0 / 0.5W J	VR2
46	1	ST	20	BR433853	CRYSTAL 6,14400MHZ HC49-U	Y1
47	15	mm	34	222837-004	TAPE, DOUBLE-SIDED 1.6MM	
48	0,015	M	32	200843-009	WIRE COP TIN-CTD Ø0.6MM	
49	2	ST	31	208801-001	CONN MINI-JUMP 36 PIN	E1-E10
50	16	ST	31	208802-002	CONN B-JUMP	

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	61	BR471534	REGULATOR-AF,ASSY A10A1	A1
2	1	ST	61	BR471550	TRAFO ASSY A10A2	A2
3	1	ST	56	BR458341	HEATSINK ASSY A10A3	A3
4	2	ST	51	202185-003	SCREW M 2.5X 5 SLTD. CYL. BR	H1
5	4	ST	51	BR275638	SCREW M 4 X 8 CHJ GULCR	H3
6	1	ST	31	222836-140	CONN D ACCESS. JACK SOCKT	H4
7	2	ST	51	210841-001	THUMBSCREW	MP1
8	1	ST	31	212654-022	CONN D 15 S/PCB ANGLE	
9	7	MM	34	201701-009	SLEEVING, SHRINK. 19.0MM B	

BR471720 POWER SUPPLY ASSY A10 220

PARTSLIST

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	37	BR471526	PWB,REGULATOR & AF A10A1	
2	4	ST	22	BR454265	CAP. ELEC 100U / 25 T	C17
	4	ST	22	BR454265	CAP. ELEC 100U / 25 T	C1
	4	ST	22	BR454265	CAP. ELEC 100U / 25 T	C21
	4	ST	22	BR454265	CAP. ELEC 100U / 25 T	C40
3	5	ST	22	BR202967	CAP. PLST 100N 100 K	C45
	5	ST	22	BR202967	CAP. PLST 100N 100 K	C47
	5	ST	22	BR202967	CAP. PLST 100N 100 K	C22
	5	ST	22	BR202967	CAP. PLST 100N 100 K	C2
	5	ST	22	BR202967	CAP. PLST 100N 100 K	C46
4	12	ST	22	BR450510	CAP. CER. 100N 63 S	C10
	12	ST	22	BR450510	CAP. CER. 100N 63 S	C23
	12	ST	22	BR450510	CAP. CER. 100N 63 S	C53
	12	ST	22	BR450510	CAP. CER. 100N 63 S	C16
	12	ST	22	BR450510	CAP. CER. 100N 63 S	C18
	12	ST	22	BR450510	CAP. CER. 100N 63 S	C42
	12	ST	22	BR450510	CAP. CER. 100N 63 S	C55
	12	ST	22	BR450510	CAP. CER. 100N 63 S	C13
	12	ST	22	BR450510	CAP. CER. 100N 63 S	C6
	12	ST	22	BR450510	CAP. CER. 100N 63 S	C3
	12	ST	22	BR450510	CAP. CER. 100N 63 S	C56
	12	ST	22	BR450510	CAP. CER. 100N 63 S	C4
5	9	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C44
	9	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C41
	9	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C34
	9	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C50
	9	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C5
	9	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C30
	9	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C43
	9	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C38
	9	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C35
6	2	ST	22	BR451053	CAP. ELEC 68U / 6,3 M	C36
	2	ST	22	BR451053	CAP. ELEC 68U / 6,3 M	C7
7	2	ST	22	BR357634	CAP. CER. 2N2 100 K HI-K	C8
	2	ST	22	BR357634	CAP. CER. 2N2 100 K HI-K	C14
8	7	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	C26
	7	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	C15
	7	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	C25
	7	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	C32
	7	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	C20
	7	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	C24
	7	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	C9
9	1	ST	22	202542-011	CAP. CER. 27P / 100G	C11
10	2	ST	22	BR454273	CAP. ELEC 220U / 25 T	C52
	2	ST	22	BR454273	CAP. ELEC 220U / 25 T	C12
11	2	ST	22	200514-004	CAP. CER 4N7 / 100K	C19
	2	ST	22	200514-004	CAP. CER 4N7 / 100K	C48

BR471534 REGULATOR-AF,ASSY A10A1

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
12	1	ST	22	200327-033	CAP. POLYPRO. 1N0 / 400 F	C27
13	2	ST	22	200327-057	CAP. POLYPRO. 10N / 63 F	C28
	2	ST	22	200327-057	CAP. POLYPRO. 10N / 63 F	C29
14	1	ST	22	BR203246	CAP. PLST 10N 400 K	C31
15	3	ST	22	221220-012	CAP. PLAST 680N / 50K	C39
	3	ST	22	221220-012	CAP. PLAST 680N / 50K	C33
	3	ST	22	221220-012	CAP. PLAST 680N / 50K	C57
16	1	ST	22	BR454281	CAP. ELEC 1M / 25 T	C37
17	1	ST	22	BR344273	CAP. PLST 22N 250 K	C49
18	1	ST	22	BR454117	CAP. PLST 68N 250 K	C51
19	1	ST	22	BR454303	CAP. ELEC 470U / 16 T LL	C54
20	9	ST	23	200352-001	DIODE 1N4148	CR7
	9	ST	23	200352-001	DIODE 1N4148	CR6
	9	ST	23	200352-001	DIODE 1N4148	CR5
	9	ST	23	200352-001	DIODE 1N4148	CR4
	9	ST	23	200352-001	DIODE 1N4148	CR3
	9	ST	23	200352-001	DIODE 1N4148	CR2
	9	ST	23	200352-001	DIODE 1N4148	CR9
	9	ST	23	200352-001	DIODE 1N4148	CR8
	9	ST	23	200352-001	DIODE 1N4148	CR1
21	6	ST	51	202185-003	SCREW M 2.5X 5 SLTD. CYL. BR	H1
22	5	ST	51	BR321494	SCREW M 3 X 5 CHM CU SN	H2
23	1	ST	51	BR276804	SCREW M 3 X 8 CHM CU SN	H3
24	6	ST	52	BR327514	NUT M 3 CONTRA M CU SN	H4
25	1	ST	56	216041-001	HEAT SINK TO-220 V-5630	H5
26	1	ST	56	200515-013	TRANS.ACCESS ISOLAT.PLD	H6
27	16	ST	56	202152-002	INSULATOR PEARL, \ 4.19X1	H7
	16	ST	56	202152-002	INSULATOR PEARL, \ 4.19X1	H10
28	4	ST	31	BR442399	TERMINAL STUD 140-1785-2	H8
29	1	ST	45	BR354554	STRAP,CABLE L191XB3,6	H9
30	1	ST	31	BR458481	CONN MOLEX 11P MALE	J2
32	1	ST	31	BR454168	CONN MOLEX 2P MALE	J4
33	1	ST	41	BR458384	SCREEN SHIELD CAN A10A1	MP1
34	1	ST	45	210840-001	RETAINER	MP2
35	2	ST	52	BR455571	STAY NUT, M2,5X15 Ø4,0-2,9	MP3
36	5	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q18
	5	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q9
	5	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q3
	5	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q8
	5	ST	26	BR359157	TRANS.LOPOW BC307B SI-P T	Q1
37	8	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q14
	8	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q6
	8	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q17
	8	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q4
	8	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q13
	8	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q11
	8	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q15

BR471534 REGULATOR-AF,ASSY A10A1

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
37	8	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q16
38	3	ST	26	BR454206	TRANS.SCR 2N6402 200V16A	Q10
	3	ST	26	BR454206	TRANS.SCR 2N6402 200V16A	Q7
	3	ST	26	BR454206	TRANS.SCR 2N6402 200V16A	Q5
39	1	ST	26	BR454605	TRANS.JFETN 2N3955 DUAL T	Q12
40	1	ST	21	600004-099	RES CARB. 12K, 0.5J	R1
41	1	ST	21	600004-082	RES CARB. 2K4, 0.5J	R3
42	11	ST	21	600004-097	RES CARB. 10K, 0.5J	R4
	11	ST	21	600004-097	RES CARB. 10K, 0.5J	R14
	11	ST	21	600004-097	RES CARB. 10K, 0.5J	R15
	11	ST	21	600004-097	RES CARB. 10K, 0.5J	R17
	11	ST	21	600004-097	RES CARB. 10K, 0.5J	R102
	11	ST	21	600004-097	RES CARB. 10K, 0.5J	R103
	11	ST	21	600004-097	RES CARB. 10K, 0.5J	R113
	11	ST	21	600004-097	RES CARB. 10K, 0.5J	R105
	11	ST	21	600004-097	RES CARB. 10K, 0.5J	R119
	11	ST	21	600004-097	RES CARB. 10K, 0.5J	R117
	11	ST	21	600004-097	RES CARB. 10K, 0.5J	R81
43	2	ST	21	600004-105	RES CARB. 22K, 0.5J	R16
	2	ST	21	600004-105	RES CARB. 22K, 0.5J	R5
44	1	ST	21	600005-347	RES FILM 30K1 / 0.6F	R6
45	1	ST	21	600005-401	RES FILM 100K / 0.6F	R7
46	3	ST	21	600004-077	RES CARB. 1K5, 0.5J	R8
	3	ST	21	600004-077	RES CARB. 1K5, 0.5J	R124
	3	ST	21	600004-077	RES CARB. 1K5, 0.5J	R125
47	2	ST	21	600004-089	RES CARB. 4K7, 0.5J	R10
	2	ST	21	600004-089	RES CARB. 4K7, 0.5J	R134
48	1	ST	21	600004-083	RES CARB. 2K7, 0.5J	R11
49	4	ST	21	600004-049	RES CARB. 100R, 0.5J	R12
	4	ST	21	600004-049	RES CARB. 100R, 0.5J	R61
	4	ST	21	600004-049	RES CARB. 100R, 0.5J	R41
	4	ST	21	600004-049	RES CARB. 100R, 0.5J	R49
50	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R18
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R37
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R53
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R43
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R135
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R52
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R35
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R51
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R29
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R28
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R20
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R42
	13	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R133
51	2	ST	21	600004-087	RES CARB. 3K9, 0.5J	R19
	2	ST	21	600004-087	RES CARB. 3K9, 0.5J	R36

BR471534 REGULATOR-AF,ASSY A10A1

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
52	6	ST	21	600004-091	RES CARB. 5K6, 0.5J	R21
	6	ST	21	600004-091	RES CARB. 5K6, 0.5J	R38
	6	ST	21	600004-091	RES CARB. 5K6, 0.5J	R39
	6	ST	21	600004-091	RES CARB. 5K6, 0.5J	R55
	6	ST	21	600004-091	RES CARB. 5K6, 0.5J	R22
	6	ST	21	600004-091	RES CARB. 5K6, 0.5J	R54
53	2	ST	21	600004-042	RES CARB. 51R, 0.5J	R40
	2	ST	21	600004-042	RES CARB. 51R, 0.5J	R23
54	2	ST	21	600004-116	RES CARB. 62K, 0.5J	R24
	2	ST	21	600004-116	RES CARB. 62K, 0.5J	R59
55	1	ST	21	600004-107	RES CARB. 27K, 0.5J	R25
56	5	ST	21	BR454184	RES WW 0R1 / 4J	R58
	5	ST	21	BR454184	RES WW 0R1 / 4J	R26
	5	ST	21	BR454184	RES WW 0R1 / 4J	R27
	5	ST	21	BR454184	RES WW 0R1 / 4J	R57
	5	ST	21	BR454184	RES WW 0R1 / 4J	R44
57	3	ST	21	600005-269	RES FILM 5K11 / 0.6F	R30
	3	ST	21	600005-269	RES FILM 5K11 / 0.6F	R31
	3	ST	21	600005-269	RES FILM 5K11 / 0.6F	R32
58	5	ST	21	600004-061	RES CARB. 330R, 0.5J	R123
	5	ST	21	600004-061	RES CARB. 330R, 0.5J	R62
	5	ST	21	600004-061	RES CARB. 330R, 0.5J	R126
	5	ST	21	600004-061	RES CARB. 330R, 0.5J	R34
	5	ST	21	600004-061	RES CARB. 330R, 0.5J	R33
59	2	ST	21	600004-053	RES CARB. 150R, 0.5J	R45
	2	ST	21	600004-053	RES CARB. 150R, 0.5J	R132
60	1	ST	21	600004-108	RES CARB. 30K, 0.5J	R46
61	1	ST	21	600005-425	RES FILM 178K / 0.6F	R47
62	1	ST	21	600005-377	RES FILM 61K9 / 0.6F	R48
63	1	ST	21	600004-057	RES CARB. 220R, 0.5J	R50
64	1	ST	21	600004-056	RES CARB. 200R, 0.5J	R56
65	2	ST	21	600004-093	RES CARB. 6K8, 0.5J	R60
	2	ST	21	600004-093	RES CARB. 6K8, 0.5J	R115
66	1	ST	21	BR454192	RES WW 0R22 / 4J	R63
67	1	ST	21	600004-063	RES CARB. 390R, 0.5J	R64
68	2	ST	21	600004-068	RES CARB. 620R, 0.5J	R65
	2	ST	21	600004-068	RES CARB. 620R, 0.5J	R87
69	2	ST	21	600004-111	RES CARB. 39K, 0.5J	R94
	2	ST	21	600004-111	RES CARB. 39K, 0.5J	R66
70	1	ST	21	600004-101	RES CARB. 15K, 0.5J	R67
71	2	ST	21	600004-058	RES CARB. 240R, 0.5J	R68
	2	ST	21	600004-058	RES CARB. 240R, 0.5J	R69
72	1	ST	21	600004-047	RES CARB. 82R, 0.5J	R70
73	1	ST	21	600004-038	RES CARB. 36R, 0.5J	R71
74	4	ST	21	600005-301	RES FILM 10K0 / 0.6F	R95
	4	ST	21	600005-301	RES FILM 10K0 / 0.6F	R72
	4	ST	21	600005-301	RES FILM 10K0 / 0.6F	R86

BR471534 REGULATOR-AF,ASSY A10A1

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
74	4	ST	21	600005-301	RES FILM 10K0 / 0.6F	R85
75	1	ST	21	600005-321	RES FILM 16K2 / 0.6F	R73
76	1	ST	21	600005-289	RES FILM 8K25 / 0.6F	R74
77	3	ST	21	235004-115	RES FILM 56K / 0.4 J	R98
	3	ST	21	235004-115	RES FILM 56K / 0.4 J	R75
	3	ST	21	235004-115	RES FILM 56K / 0.4 J	R76
78	6	ST	21	600004-129	RES CARB. 220K, 0.5J	R77
	6	ST	21	600004-129	RES CARB. 220K, 0.5J	R79
	6	ST	21	600004-129	RES CARB. 220K, 0.5J	R97
	6	ST	21	600004-129	RES CARB. 220K, 0.5J	R78
	6	ST	21	600004-129	RES CARB. 220K, 0.5J	R91
	6	ST	21	600004-129	RES CARB. 220K, 0.5J	R80
79	2	ST	21	600004-085	RES CARB. 3K3, 0.5J	R82
	2	ST	21	600004-085	RES CARB. 3K3, 0.5J	R84
80	3	ST	21	BR359165	RES VAR 10K 1/2K CERM	R83
	3	ST	21	BR359165	RES VAR 10K 1/2K CERM	R90
	3	ST	21	BR359165	RES VAR 10K 1/2K CERM	R118
81	1	ST	21	600004-110	RES CARB. 36K, 0.5J	R88
82	1	ST	21	BR450251	RES NTC 15K K M822	R89
83	2	ST	21	600004-121	RES CARB. 100K, 0.5J	R116
	2	ST	21	600004-121	RES CARB. 100K, 0.5J	R92
84	2	ST	21	600004-113	RES CARB. 47K, 0.5J	R114
	2	ST	21	600004-113	RES CARB. 47K, 0.5J	R93
85	1	ST	21	600005-331	RES FILM 20K5 / 0.6F	R96
86	4	ST	21	600004-081	RES CARB. 2K2, 0.5J	R109
	4	ST	21	600004-081	RES CARB. 2K2, 0.5J	R99
	4	ST	21	600004-081	RES CARB. 2K2, 0.5J	R110
	4	ST	21	600004-081	RES CARB. 2K2, 0.5J	R111
87	2	ST	21	600004-071	RES CARB. 820R, 0.5J	R101
	2	ST	21	600004-071	RES CARB. 820R, 0.5J	R100
88	1	ST	21	600004-095	RES CARB. 8K2, 0.5J	R104
89	3	ST	21	600004-075	RES CARB. 1K2, 0.5J	R112
	3	ST	21	600004-075	RES CARB. 1K2, 0.5J	R108
	3	ST	21	600004-075	RES CARB. 1K2, 0.5J	R106
90	1	ST	21	600004-065	RES CARB. 470R, 0.5J	R107
91	1	ST	21	600004-118	RES CARB. 75K, 0.5J	R120
92	2	ST	21	600004-055	RES CARB. 180R, 0.5J	R121
	2	ST	21	600004-055	RES CARB. 180R, 0.5J	R128
93	1	ST	21	600004-033	RES CARB. 22R, 0.5J	R122
94	1	ST	21	600004-040	RES CARB. 43R, 0.5J	R127
95	1	ST	21	600004-009	RES CARB. 2R2, 0.5J	R129
96	1	ST	21	BR462004	RES WW 1R0 / 5J	R130
97	1	ST	21	BR458686	RES WW 4R7 / 4J	R131
98	1	ST	33	BR471798	SWITCH, PCP DIP-FIX 8X ON/OF	S1
99	2	ST	25	BR362859	TRAFO,LINE 600:600R	T1
	2	ST	25	BR362859	TRAFO,LINE 600:600R	T2
100	13	ST	31	202168-030	COLLAR SLEEVES Ø1.3X10MM	TP

BR471534 REGULATOR-AF,ASSY A10A1

PARTSLIST

Printed: 1999-02-10

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
101	1	ST	24	BR454370	IC, 79MGU1 VOLT REGL.	U1
102	1	ST	24	200518-003	IC, LM723CN, REG	U2
103	1	ST	24	203809-003	IC, LF 356 N, OP. AMP.	U3
104	1	ST	24	200394-003	IC, LM301A OP.AMP.	U4
105	1	ST	24	207287-001	IC, LM324N 4X OP.AMP.	U5
106	2	ST	24	236675-002	IC, TL084, OP AMP. QUAD	U6
	2	ST	24	236675-002	IC, TL084, OP AMP. QUAD	U7
107	1	ST	24	BR454230	IC, LM3054N TRANS.ARR	U8
108	1	ST	24	BR443964	IC, TDA2002 POW. AMPL	U9
109	2	ST	23	203527-010	DIODE ZENER 5V6 / 0.5W J	VR5
	2	ST	23	203527-010	DIODE ZENER 5V6 / 0.5W J	VR4
110	2	ST	23	203527-021	DIODE ZENER 16V0 / 0.5W J	VR2
	2	ST	23	203527-021	DIODE ZENER 16V0 / 0.5W J	VR3
111	1	ST	23	BR228869	DIO ZEN ZPD 7.5 7.5V 0.5W	VR6
112	2	ST	23	BR228818	DIO ZEN ZPD 2.7 2.7V 0.5W	VR8
	2	ST	23	BR228818	DIO ZEN ZPD 2.7 2.7V 0.5W	VR7
113	1	ST	23	203527-006	DIODE ZENER 3V9 / 0.5W J	VR9
114	1	ST	26	235032-003	TRANSISTOR, PNP, BC327-25	Q2
115	1	ST	21	600004-029	RES CARB. 15R, 0.5J	R136
116	1	ST	37	BR464902	FLATCABLE.ASSY W1 A10	
117	1	ST	48	214073-004	LABEL, ADHESIVE, ESD	
118	1	ST	22	235010-001	CAP. ELEC 1U0 / 25M	C58

BR471534 REGULATOR-AF,ASSY A10A1

PARTSLIST

Printed: 1999-02-10

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	37	BR471542	PWB,TRANSFORMER AS. A10A	
2	1	ST	60	BR471968	TERMINAL ASSY A10A2A1	A1
3	3	ST	22	BR385190	CAP. CER. 4N7 5KV M HI-K	C2
	3	ST	22	BR385190	CAP. CER. 4N7 5KV M HI-K	C1
	3	ST	22	BR385190	CAP. CER. 4N7 5KV M HI-K	C3
4	1	ST	22	BR458511	CAP. PLST 100N 630 K	C4
5	3	ST	22	BR202967	CAP. PLST 100N 100 K	C5
	3	ST	22	BR202967	CAP. PLST 100N 100 K	C6
	3	ST	22	BR202967	CAP. PLST 100N 100 K	C7
6	1	ST	22	BR450510	CAP. CER. 100N 63 S	C8
7	1	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C9
8	5	ST	22	BR366471	CAP. ELEC 1M / 40 T T	C10
	5	ST	22	BR366471	CAP. ELEC 1M / 40 T T	C11
	5	ST	22	BR366471	CAP. ELEC 1M / 40 T T	C12
	5	ST	22	BR366471	CAP. ELEC 1M / 40 T T	C14
	5	ST	22	BR366471	CAP. ELEC 1M / 40 T T	C13
9	6	ST	22	BR373516	CAP. ELEC 2M2 / 25 T LL	C17
	6	ST	22	BR373516	CAP. ELEC 2M2 / 25 T LL	C18
	6	ST	22	BR373516	CAP. ELEC 2M2 / 25 T LL	C16
	6	ST	22	BR373516	CAP. ELEC 2M2 / 25 T LL	C15
	6	ST	22	BR373516	CAP. ELEC 2M2 / 25 T LL	C19
	6	ST	22	BR373516	CAP. ELEC 2M2 / 25 T LL	C20
10	4	ST	23	222210-003	DIODE MR502	CR3
	4	ST	23	222210-003	DIODE MR502	CR1
	4	ST	23	222210-003	DIODE MR502	CR2
	4	ST	23	222210-003	DIODE MR502	CR4
11	3	ST	33	BR394629	FUSE 20X5MM 6,3A T	F3
	3	ST	33	BR394629	FUSE 20X5MM 6,3A T	F1
	3	ST	33	BR394629	FUSE 20X5MM 6,3A T	F2
12	5	ST	51	202185-003	SCREW M 2.5X 5 SLTD. CYL. BR	H1
13	4	ST	51	BR327239	SCREW M 4 X10 CHM CU SN	H2
14	1	ST	51	BR321494	SCREW M 3 X 5 CHM CU SN	H3
15	1	ST	51	200668-054	SCREW M5 X 60	H4
16	1	ST	52	BR327549	NUT M 5 M CU SN	H5
17	1	ST	52	BR482978	STAY NUT, M3 X 6 N5 W/TAB	H6
18	18	ST	31	BR442399	TERMINAL STUD 140-1785-2	H7
20	1	ST	45	BR475343	STRAP,CABLE L292XB4,8	H9
21	2	ST	25	232316-005	CHOKES 1.5A / 25 H	L2
	2	ST	25	232316-005	CHOKES 1.5A / 25 H	L1
22	1	ST	45	210840-001	RETAINER	MP1
23	2	ST	52	BR458120	STAY NUT, M4 X62 N7	MP2
24	2	ST	52	BR458139	STAY NUT, M4 X64 N7	MP3
25	1	ST	41	BR458430	HEAT SINK A10A2 M 3000	MP4
26	1	ST	21	235005-247	RES FILM 3K01 / 0.4F	R1
27	1	ST	21	235005-138	RES FILM 243R / 0.4F	R2
28	1	ST	25	BR471976	TRAFO,MAINS 125/125 9,7/2	T1
29	1	ST	24	211176-007	IC, LM317, ADJ. VOLTAGE RE	U1

BR471550 TRAFO ASSY A10A2

PARTSLIST

Printed: 1999-02-10

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
31	6	ST	31	201268-001	CLIP ELEC	XF1
	6	ST	31	201268-001	CLIP ELEC	XF2
	6	ST	31	201268-001	CLIP ELEC	XF3
32	2	ST	51	BR321494	SCREW M 3 X 5 CHM CU SN	
33	2	ST	51	BR327220	SCREW M 4 X 8 CHM CU SN	
34	0,01	M	32	200843-009	WIRE COP TIN-CTD Ø0.6MM	
35	1	ST	48	214073-004	LABEL, ADHESIVE, ESD	
36	10	ML	76	205254-001	ADHESIVE SILICONE, RTV	
37	0,08	M	44	BR377503	EDGING KANTLIST F/2,1-3MM	

BR471550 TRAFO ASSY A10A2

PARTSLIST

Printed: 1999-02-10

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	23	206155-003	DIODE BRIDGE 220V 15A CRS	CR5
2	2	ST	33	201270-017	FUSE 5X20 SLOW 1,0A	F2
	2	ST	33	201270-017	FUSE 5X20 SLOW 1,0A	F1
3	2	ST	51	BR403377	SCREW SELFT.4X5/16UHPX-AB	H1
4	1	ST	51	BR327174	SCREW M 3 X12 CHM CU SN	H2
5	1	ST	31	BR457736	CONN MAINS 3P MALE	J1
6	1	ST	41	BR476102	REAR PLATE A10	MP1
7	1	ST	33	BR248312	SWITCH, TOGGLE DPDT 2A	S1
8	2	ST	33	BR358975	FUSE ACCES.HLDR 5X20 6,3A	XF2
	2	ST	33	BR358975	FUSE ACCES.HLDR 5X20 6,3A	XF1
9	0,11	M	32	BR329932	WIRE,ELEC 0,75 BROWN	
10	0,11	M	32	BR329983	WIRE,ELEC 0,75 GREEN	
11	0,11	M	32	BR329967	WIRE,ELEC 0,75 YELLOW	
12	0,11	M	32	BR329940	WIRE,ELEC 0,75 RED	
13	0,180	M	32	BR329924	WIRE,ELEC 0,75 BLACK	
14	0,22	M	32	BR329991	WIRE,ELEC 0,75 BLUE	
15	0,11	M	32	BR333034	WIRE,ELEC 0,75 WHITE	
16	0,280	M	32	BR333018	WIRE,ELEC 0,75 VIOLET	
17	0,050	MM	34	201701-004	SLEEVING, SHRINK. 3.2MM B	
18	1	G	78	200799-001	COMPOUND.THERMAL,SILICO	
19	0,180	M	32	BR329959	WIRE,ELEC 0,75 ORANGE	
20	1	ST	53	200559-002	WASHER LOCK 3.1X0.8MM	

BR471968 TERMINAL ASSY A10A2A1

PARTSLIST

Printed: 1999-02-10

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	3	ST	26	BR458546	TRANS.ACCESS ISOLATIONS	H1
2	3	ST	56	200515-013	TRANS.ACCESS ISOLAT.PLD	H2
3	4	ST	51	BR327220	SCREW M 4 X 8 CHM CU SN	H3
4	6	ST	51	BR321494	SCREW M 3 X 5 CHM CU SN	H4
5	7	ST	53	BR336874	WASHER FLAT Ø 3MM CU SN	H5
6	7	ST	54	BR436518	RIVET, BLIND 3.3/4.8	H6
7	3	ST	45	BR458465	CLAMP,CABLE CV3 3MMX7	H7
8	7	ST	45	BR458473	CLAMP,CABLE CV6 6MMX7	H8
9	0,100	MM	34	BR220108	FLEX SILICONE 1,6 WHT	H9
10	1	ST	41	BR458147	BACK-SPACE A10A3	MP1
11	1	ST	56	BR458244	HEAT SINK A10A3	MP2
12	2	ST	26	BR454400	TRANS.DARLN BDX 54A SI-P	Q1
	2	ST	26	BR454400	TRANS.DARLN BDX 54A SI-P	Q3
13	1	ST	26	235035-004	TRANSISTOR NPN DARL, BDX5	Q2
14	1	ST	37	BR458910	CABLE ASSY W1 A10A3	W1

BR458341 HEATSINK ASSY A10A3

PARTSLIST

Printed: 1999-02-10

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	60	600135-001	FR PAN CKT RX/RC4010, A11A1	A1
2	4	ST	51	202185-003	SCREW M 2.5X 5 SLTD. CYL. BR	H1
3	8	ST	51	BR321494	SCREW M 3 X 5 CHM CU SN	H2
4	4	ST	51	BR450545	SCREW M 5 X12 UHR	H3
5	8	ST	51	BR475785	SCREW SELFT.2X1/8 PHPX-	H4
6	8	ST	53	BR245674	WASHER NYLON Ø10MM	H6
7	2	ST	51	BR403342	SCREW M 3 X 6 R UNB PINOL	H7
8	1	ST	43	BR454443	KNOB Ø10MM BLCK	H8
9	1	ST	43	BR454435	KNOB,CAB 3,3X Ø7,2	H9
10	1	ST	43	BR452971	KNAP SOØ44.5 ØB.2	H10
11	3	ST	43	BR454478	KNOB 17X Ø14,5	H12
12	3	ST	43	BR454451	KNOB,CAB 4,8X Ø11	H13
13	1	ST	53	BR230278	WASHER LOCK Ø 5MM X0,7M	H14
14	2	ST	45	201197-049	STRAP, CABLE, NAT Ø20X2.5	
16	2	ST	51	BR494380	SCREW M 3 X 4 CHM CU SN	
17	4	ST	51	BR333255	SCREW M 3 X 6 UHJ GULCR	H18
19	2	ST	54	BR436518	RIVET, BLIND 3.3/4.8	H20
20	1	ST	52	BR321486	NUT M10F 10X14X3MM	H21
21	0,360	D2	20	BR475289	CLOTH, LOUDSPEAK BLK 60X6	H22
22	1	ST	53	BR402923	WASHER FLAT Ø10MM GULCR	H23
23	1	ST	31	206165-002	CONN JACK, SWITCH, 6.3MM	J1
24	1	ST	20	BR474924	LOUDSPEAKER 8R 10W 60X60	LS1
25	2	ST	43	BR216674	HANDLE FOR 5 1/4" 111MM	MP1
26	4	ST	51	BR260827	THUMBSCREW,KNURLED M6	MP2
27	4	ST	46	BR268682	GUIDE F/THUMBSCREW 260827	MP3
28	1	ST	41	600129-001	FRONT PLATE RC4010	MP4
29	1	ST	41	600128-001	GUIDE SHEET A11	MP5
30	2	ST	46	BR445827	BRACKET,FRONTPLATE A11	MP6
31	1	ST	57	BR458015	BUSHING, PILOT A11	MP7
32	1	ST	42	BR457728	CODE WHEEL A11	MP9
33	1	ST	42	BR458023	FLY WHEEL A11	MP10
34	1	ST	42	BR458007	SHAFT F/CODE WHEEL A11	MP11
35	1	ST	41	BR457957	SCREEN A11	MP12
36	4	ST	53	BR267015	WASHER NYLON 12MM x15MM	MP13
37	1	ST	48	BR490377	WINDOW,DSPL RX4010	MP14
38	1	ST	41	BR471690	MOUNTING F/LOUDSP. A11A1	MP16
39	2	ST	52	BR377104	STAY NUT, M3 X 5,5 N5	MP17
41	1	ST	21	BR454516	RES VAR 10K CERM LIN	R1
42	2	ST	21	BR454508	RES VAR 1K0 CERM LIN	R3
	2	ST	21	BR454508	RES VAR 1K0 CERM LIN	R2
43	1	ST	21	BR459313	RES VAR 4K7 A11R4	R4
44	1	ST	21	600004-036	RES CARB. 30R, 0.5J	R5
45	1	ST	37	BR458937	CABLE ASSY W1 A11	W1
46	1	ST	37	BR458945	CABLE ASSY W2 A11	W2
47	1	ST	37	BR458953	CABLE ASSY W3 A11	W3
48	1	ST	53	BR499161	WASHER PS7X13X0,1	
49	8	ST	53	221387-135	WASHER LOCK 2.8X5.3X0.6MM	

BR495131 FRONT PANEL RC4010 A11

PARTSLIST

Printed: 1999-02-10

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
50	0,300	M	34	BR490075	TAPE,DOUBLE SIDE 0,13X10	
51	2	ST	53	200559-002	WASHER LOCK 3.1X0.8MM	
53	1	ST	43	600081-014	KNOB,BLACK,WHT.TEXT "ADR	

BR495131 FRONT PANEL RC4010 A11

PARTSLIST

Printed: 1999-02-10

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	37	600136-001	PWB, A11A1	
2	1	ST	60	BR489883	DSPL BD A11A1A1 RX/RC4010	A1
3	5	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C15
	5	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C3
	5	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C5
	5	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C1
	5	ST	22	235010-006	CAP. ELEC 6U8 / 25M	C16
4	5	ST	22	200514-204	CAP. CER 100N / 50K	C11
	5	ST	22	200514-204	CAP. CER 100N / 50K	C2
	5	ST	22	200514-204	CAP. CER 100N / 50K	C4
	5	ST	22	200514-204	CAP. CER 100N / 50K	C6
	5	ST	22	200514-204	CAP. CER 100N / 50K	C8
5	4	ST	22	BR450510	CAP. CER. 100N 63 S	C9
	4	ST	22	BR450510	CAP. CER. 100N 63 S	C7
	4	ST	22	BR450510	CAP. CER. 100N 63 S	C19
	4	ST	22	BR450510	CAP. CER. 100N 63 S	C10
6	1	ST	22	BR451053	CAP. ELEC 68U / 6,3 M	C12
7	1	ST	22	BR203378	CAP. TAN. 10U / 16 S	C13
8	1	ST	22	BR357642	CAP. CER. 10N 100 S HI-K	C14
10	2	ST	22	BR357650	CAP. CER. 22N 63 A HI-K	C18
	2	ST	22	BR357650	CAP. CER. 22N 63 A HI-K	C17
12	2	ST	23	200352-001	DIODE 1N4148	CR16
	2	ST	23	200352-001	DIODE 1N4148	CR17
13	2	ST	51	BR465402	SCREW M 2.5X 6 CHM CU SN	H1
14	20	ST	51	BR321494	SCREW M 3 X 5 CHM CU SN	H2
15	1	ST	51	BR276804	SCREW M 3 X 8 CHM CU SN	H3
16	2	ST	53	BR321540	WASHER FLAT Ø 2,5 M CU SN	H5
17	1	ST	52	200560-003	NUT PLAIN HEX M 3	H6
18	2	ST	52	BR375209	NUT M 2,5 M CU SN	H7
20	28	ST	53	BR380105	WASHER FLAT Ø 3MM CU SN	H9
21	1	ST	31	BR452688	TRANS.ACCESS TALLFJEDER	H10
22	0,48	MM	34	BR220140	FLEX SILICONE 0,5/1 TRAN	H11
23	16	ST	51	BR494380	SCREW M 3 X 4 CHM CU SN	H12
24	3	ST	25	200730-003	COIL,RF	L1
	3	ST	25	200730-003	COIL,RF	L3
	3	ST	25	200730-003	COIL,RF	L2
59	14	ST	56	224537-009	STAY NUT, M3 X15 N5	MP34,MP36
60	8	ST	52	BR460338	STAY NUT, M3 X13,3 N5	MP37
63	1	ST	26	BR362980	TRANS.HIPOW MJE243	Q9
64	3	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q11
	3	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q13
	3	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q12
65	1	ST	26	BR399914	TRANS.JFETN J 309 TO-92	Q14
66	11	ST	26	235024-002	TRANSISTOR, BC557B	Q3
	11	ST	26	235024-002	TRANSISTOR, BC557B	Q2
	11	ST	26	235024-002	TRANSISTOR, BC557B	Q4
	11	ST	26	235024-002	TRANSISTOR, BC557B	Q7

600135-001 FR PAN CKT RX/RC4010, A11A1

FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
66	11	ST	26	235024-002	TRANSISTOR, BC557B	Q5
	11	ST	26	235024-002	TRANSISTOR, BC557B	Q17
	11	ST	26	235024-002	TRANSISTOR, BC557B	Q16
	11	ST	26	235024-002	TRANSISTOR, BC557B	Q10
	11	ST	26	235024-002	TRANSISTOR, BC557B	Q6
	11	ST	26	235024-002	TRANSISTOR, BC557B	Q8
	11	ST	26	235024-002	TRANSISTOR, BC557B	Q1
67	3	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q15
	3	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q19
	3	ST	26	235031-003	TRANSISTOR, NPN, BC547B	Q18
68	6	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R46
	6	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R52
	6	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R49
	6	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R45
	6	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R1
	6	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R42
69	1	ST	21	203237-022	RES NETW 8 X 1K5 1/4G	R2
70	1	ST	21	206088-017	RES NETW 9 X 10K 1/5G	R3
71	8	ST	21	BR241040	RES CARB. 15R 1/2JSFR25H	R11
	8	ST	21	BR241040	RES CARB. 15R 1/2JSFR25H	R9
	8	ST	21	BR241040	RES CARB. 15R 1/2JSFR25H	R8
	8	ST	21	BR241040	RES CARB. 15R 1/2JSFR25H	R7
	8	ST	21	BR241040	RES CARB. 15R 1/2JSFR25H	R10
	8	ST	21	BR241040	RES CARB. 15R 1/2JSFR25H	R4
	8	ST	21	BR241040	RES CARB. 15R 1/2JSFR25H	R5
	8	ST	21	BR241040	RES CARB. 15R 1/2JSFR25H	R6
72	1	ST	21	235004-075	RES FILM 1K2 / 0.4 J	R12
73	1	ST	21	235004-103	RES FILM 18K / 0,4 J	R13
74	3	ST	21	235004-082	RES FILM 2K4 / 0,4 J	R14
	3	ST	21	235004-082	RES FILM 2K4 / 0,4 J	R47
	3	ST	21	235004-082	RES FILM 2K4 / 0,4 J	R50
75	1	ST	21	235004-115	RES FILM 56K / 0.4 J	R15
76	3	ST	21	235004-089	RES FILM 4K7 / 0.4 J	R19
	3	ST	21	235004-089	RES FILM 4K7 / 0.4 J	R17
	3	ST	21	235004-089	RES FILM 4K7 / 0.4 J	R16
77	1	ST	21	206088-013	RES NETW 7 X 4K7 1/5G	R18
78	3	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R22
	3	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R21
	3	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R20
80	1	ST	21	206088-007	RES NETW 9 X 1K0 1/5G	R24
81	1	ST	21	203237-026	RES NETW 8 X 15K 1/4G	R25
82	1	ST	21	235005-318	RES FILM 15K0 / 0,4F	R26
83	8	ST	21	235005-285	RES FILM 7K50 / 0.4F	R31
	8	ST	21	235005-285	RES FILM 7K50 / 0.4F	R28
	8	ST	21	235005-285	RES FILM 7K50 / 0.4F	R30
	8	ST	21	235005-285	RES FILM 7K50 / 0.4F	R32
	8	ST	21	235005-285	RES FILM 7K50 / 0.4F	R33

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
83	8	ST	21	235005-285	RES FILM 7K50 / 0.4F	R34
	8	ST	21	235005-285	RES FILM 7K50 / 0.4F	R27
	8	ST	21	235005-285	RES FILM 7K50 / 0.4F	R29
84	1	ST	21	235004-121	RES FILM 100K / 0.4 J	R35
85	1	ST	21	235004-101	RES FILM 15K / 0.4 J	R36
86	1	ST	21	235004-063	RES FILM 390R / 0,4 J	R37
87	5	ST	21	235004-097	RES FILM 10K / 0.4 J	R43
	5	ST	21	235004-097	RES FILM 10K / 0.4 J	R38
	5	ST	21	235004-097	RES FILM 10K / 0.4 J	R44
	5	ST	21	235004-097	RES FILM 10K / 0.4 J	R53
	5	ST	21	235004-097	RES FILM 10K / 0.4 J	R54
88	1	ST	21	235004-090	RES FILM 5K1 / 0,4 J	R39
89	2	ST	21	235004-105	RES FILM 22K / 0.4 J	R48
	2	ST	21	235004-105	RES FILM 22K / 0.4 J	R51
91	1	ST	33	BR471992	SWITCH, SLIDE SPDT F/PWB	S33
92	1	ST	24	206072-095	IC, --74HCT138, DECODER	U1
93	1	ST	24	200463-095	IC, --74HCT 02, NOR	U2
94	3	ST	24	203469-006	IC, --74 06N	U12
	3	ST	24	203469-006	IC, --74 06N	U10
	3	ST	24	203469-006	IC, --74 06N	U3
95	1	ST	24	203927-095	IC, --74HCT 14, INVERTERS	U4
96	1	ST	24	213289-095	IC, --74HCT373E	U5
97	1	ST	24	BR450294	IC, TL 082CP OP.AMP.	U6
98	2	ST	24	200896-095	IC, --74HCT164 SHIFT RE	U8
	2	ST	24	200896-095	IC, --74HCT164 SHIFT RE	U7
99	1	ST	24	211115-095	IC, --74HCT240 8XBUF.IN	U9
100	1	ST	24	200888-026	IC, --74LS 74N, 2X D FF	U11
101	1	ST	24	BR473928	IC, HYBRID OPB822SD OPTO S	U13
102	1	ST	37	BR459550	FLATCABLE ASSY W1 A11	W1
103	3	ST	31	BR451479	CONN AMP MODU2 10P FEMAL	XP1
	3	ST	31	BR451479	CONN AMP MODU2 10P FEMAL	XP3
	3	ST	31	BR451479	CONN AMP MODU2 10P FEMAL	XP2
104	1	G	78	200799-001	COMPOUND.THERMAL,SILICO	
105	1	ST	48	214073-004	LABEL, ADHESIVE, ESD	
106	1	ST	60	600131-001	NUM. KEYBOARD, A11A1A2	A11A1A2
107	1	ST	60	600133-001	MODE KEY BOARD, A11A1A3,	A11A1A3
109	2	ST	37	600137-001	FLATCABLE ASSY, 16P, 150MM	W4
	2	ST	37	600137-001	FLATCABLE ASSY, 16P, 150MM	W5

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	37	BR489840	PWB,DSPL BD A11A1A1	
2	2	ST	23	200352-001	DIODE 1N4148	CR1
	2	ST	23	200352-001	DIODE 1N4148	CR2
3	1	ST	23	BR497029	DIO LED HLMPQ101 RED MINI	CR3
4	3	ST	31	BR490458	CONN AMP MODU2 10P MALE	P3
	3	ST	31	BR490458	CONN AMP MODU2 10P MALE	P1
	3	ST	31	BR490458	CONN AMP MODU2 10P MALE	P2
5	11	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q11
	11	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q1
	11	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q2
	11	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q9
	11	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q3
	11	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q7
	11	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q4
	11	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q6
	11	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q8
	11	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q10
	11	ST	26	235034-001	TRANSISTOR NPN DARL. MPSA	Q5
6	11	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R1
	11	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R2
	11	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R18
	11	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R19
	11	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R15
	11	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R13
	11	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R11
	11	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R12
	11	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R17
	11	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R16
	11	ST	21	235004-085	RES FILM 3K3 / 0.4 J	R14
7	1	ST	21	235004-073	RES FILM 1K0 / 0.4 J	R3
8	1	ST	21	235004-082	RES FILM 2K4 / 0,4 J	R4
9	2	ST	21	235004-084	RES FILM 3K0 / 0,4 J	R5
	2	ST	21	235004-084	RES FILM 3K0 / 0,4 J	R6
10	1	ST	21	235004-106	RES FILM 24K / 0,4 J	R7
11	1	ST	21	235004-097	RES FILM 10K / 0.4 J	R8
12	2	ST	21	235004-065	RES FILM 470R / 0,4 J	R9
	2	ST	21	235004-065	RES FILM 470R / 0,4 J	R10
13	1	ST	21	235004-057	RES FILM 220R / 0.4 J	R20
14	10	ST	24	BR489859	IC, DSPL HD1077R 7 SEGM.RE	U2
	10	ST	24	BR489859	IC, DSPL HD1077R 7 SEGM.RE	U6
	10	ST	24	BR489859	IC, DSPL HD1077R 7 SEGM.RE	U3
	10	ST	24	BR489859	IC, DSPL HD1077R 7 SEGM.RE	U5
	10	ST	24	BR489859	IC, DSPL HD1077R 7 SEGM.RE	U8
	10	ST	24	BR489859	IC, DSPL HD1077R 7 SEGM.RE	U4
	10	ST	24	BR489859	IC, DSPL HD1077R 7 SEGM.RE	U9
	10	ST	24	BR489859	IC, DSPL HD1077R 7 SEGM.RE	U10
	10	ST	24	BR489859	IC, DSPL HD1077R 7 SEGM.RE	U7

BR489883 DSPL BD A11A1A1 RX/RC4010

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
14	10	ST	24	BR489859	IC, DSPL HD1077R 7 SEGM.RE	U1
15	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U13
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U26
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U25
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U15
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U23
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U12
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U14
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U22
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U16
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U17
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U21
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U24
	13	ST	24	BR471380	IC, DSPL HLMP2300 LGHT BAR	U11
16	1	ST	24	BR446327	IC, UAA 170 LED DRIVER	U18
17	2	ST	23	223807-001	LED ARRAY 10 ELEMENT RED	U19
	2	ST	23	223807-001	LED ARRAY 10 ELEMENT RED	U20

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
28	1	ST	43	600081-018	KNOB,BLACK,WHT.TEXT "BFO	MP4
29	1	ST	43	600081-009	KNOB,BLACK,WHT.TEXT "9"	MP5
30	1	ST	43	600081-006	KNOB,BLACK,WHT.TEXT "6"	MP6
31	1	ST	43	600081-003	KNOB,BLACK,WHT.TEXT "3"	MP7
32	1	ST	43	600081-021	KNOB,BLACK,WHT.TEXT "C"	MP8
36	1	ST	43	600081-016	KNOB,BLACK,WHT.TEXT "SCN	MP12
37	1	ST	43	600081-007	KNOB,BLACK,WHT.TEXT "7"	MP13
38	1	ST	43	600081-004	KNOB,BLACK,WHT.TEXT "4"	MP14
39	1	ST	43	600081-001	KNOB,BLACK,WHT.TEXT "1"	MP15
40	1	ST	43	600081-010	KNOB,BLACK,WHT.TEXT "0"	MP16
44	1	ST	43	600081-011	KNOB,BLACK,WHT.TEXT "RCL	MP20
45	1	ST	43	600081-012	KNOB,BLACK,WHT.TEXT "STO	MP21
47	1	ST	43	600081-015	KNOB,BLACK,WHT.TEXT "MO	MP23
51	1	ST	43	600081-019	KNOB,BLACK,WHT.TEXT "TUN	MP27
52	1	ST	43	600081-008	KNOB,BLACK,WHT.TEXT "8"	MP28
53	1	ST	43	600081-005	KNOB,BLACK,WHT.TEXT "5"	MP29
54	1	ST	43	600081-002	KNOB,BLACK,WHT.TEXT "2"	MP30
55	1	ST	43	600081-020	KNOB,BLACK,WHT.TEXT "."	MP31
56	1	ST	37	600132-001	PWB, A11A1A2	
61	1	ST	43	600081-017	KNOB,BLACK,WHT.TEXT "PRG	MP38
79	4	ST	21	235004-081	RES FILM 2K2 / 0.4 J	R1
	4	ST	21	235004-081	RES FILM 2K2 / 0.4 J	R4
	4	ST	21	235004-081	RES FILM 2K2 / 0.4 J	R3
	4	ST	21	235004-081	RES FILM 2K2 / 0.4 J	R2
90	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S27
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S12
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S31
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S21
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S7
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S28
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S22
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S30
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S20
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S15
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S4
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S16
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S13
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S14
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S5
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S6
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S29
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S23
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S8
	20	ST	33	600078-001	SWITCH, PUSH BU.SPST NO	S32
108	1	ST	31	211918-019	CONN FLAT 16-PIN, ANGLE	P4

600131-001 NUM. KEYBOARD, A11A1A2

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
25	1	ST	43	600082-030	KNOB,BLACK,WHT.TEXT "SLW	MP1
26	1	ST	43	600082-026	KNOB,BLACK,WHT.TEXT "INT"	MP2
27	1	ST	43	600082-022	KNOB,BLACK,WHT.TEXT "AM"	MP3
33	1	ST	43	600082-032	KNOB,BLACK,WHT.TEXT "ATT	MP9
34	1	ST	43	600082-028	KNOB,BLACK,WHT.TEXT "VNR	MP10
35	1	ST	43	600082-024	KNOB,BLACK,WHT.TEXT "CW"	MP11
41	1	ST	43	600082-029	KNOB,BLACK.WHT.TEXT "OFF	MP17
42	1	ST	43	600082-025	KNOB,BLACK,WHT.TEXT "WID	MP18
43	1	ST	43	600082-021	KNOB,BLACK,WHT.TEXT "SSB"	MP19
48	1	ST	43	600082-031	KNOB,BLACK,WHT.TEXT "FST"	MP24
49	1	ST	43	600082-027	KNOB,BLACK,WHT.TEXT "NAR	MP25
50	1	ST	43	600082-023	KNOB,BLACK,WHT.TEXT "RT"	MP26
57	1	ST	37	600134-001	PWB, A11A1A3	
79	4	ST	21	235004-081	RES FILM 2K2 / 0.4 J	R2
	4	ST	21	235004-081	RES FILM 2K2 / 0.4 J	R3
	4	ST	21	235004-081	RES FILM 2K2 / 0.4 J	R4
	4	ST	21	235004-081	RES FILM 2K2 / 0.4 J	R1
90	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S18
	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S17
	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S26
	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S25
	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S24
	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S9
	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S1
	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S11
	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S10
	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S2
	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S3
	12	ST	33	600079-001	SWITCH, PUSH BU.SPST NO W.	S19
110	1	ST	31	211918-019	CONN FLAT 16-PIN, ANGLE	P5

600133-001 MODE KEY BOARD, A11A1A3,

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	60	BR471925	MOTHERB ASSY A12A1 RC40..	A1
2	16	ST	52	BR450588	NUT M 3 SQUARE 3X7X2,2MM	H2
3	12	ST	51	BR276723	SCREW M 3 X 8 UHM CU SN	H3
4	4	ST	51	BR436909	SCREW M 3 X 8 UHR UNBRAK	H4
5	40	ST	51	BR450561	SCREW SELFTAP.4X3/8 PH-PL	H5
6	20	ST	51	BR321494	SCREW M 3 X 5 CHM CU SN	H6
7	12	ST	51	BR495239	SCREW M 4 X 4 CHJ Z	H7
8	1	ST	41	BR474991	PLATE,JUNCTION A12	MP1
9	8	ST	41	BR445886	PROFILE,PC 1M	MP2
10	2	ST	41	BR445894	PROFILE,PC 1M DRILL	MP3
11	1	ST	41	BR445908	PROFILE,PC 1,5M	MP4
12	2	ST	41	BR445940	PROFILE,SIDE DRILL.	MP5
13	2	ST	41	BR458600	RAIL SECTION A12	MP6
14	6	ST	41	BR495026	SPLICE-PIECE A12	MP7
15	10	ST	52	BR387681	STAY NUT, M3 X10 N5	MP8
16	18	ST	51	BR333417	SCREW M 4 X10 UHJ GULCR	H8
17	8	ST	46	BR497266	BRACKET FOR 1M PROFILE	MP9
18	1	ST	46	BR497274	BRACKET FOR 1,5M PROFILE	MP10
19	9	ST	46	BR497282	FISHPLATE A12	MP11
20	12	ST	53	221387-135	WASHER LOCK 2.8X5.3X0.6MM	
22	10	ST	53	BR380105	WASHER FLAT Ø 3MM CU SN	
23	1	G	78	204729-001	GREASE, WHITE	

BR476056 CHASSIS ASSY A12 RC40..

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FN NO	QTY	U M	CLASS	Item Number	Description:	REF. DES.
1	1	ST	37	BR471917	PWB MOTHERBRD.	
2	2	ST	22	200514-204	CAP. CER 100N / 50K	C1
	2	ST	22	200514-204	CAP. CER 100N / 50K	C2
3	16	ST	31	BR454419	CONN PCB ACCES CODE PIN	H1
4	1	ST	21	600004-081	RES CARB. 2K2, 0.5J	R6
5	5	ST	21	600004-073	RES CARB. 1K0, 0.5J	R7
	5	ST	21	600004-073	RES CARB. 1K0, 0.5J	R8
	5	ST	21	600004-073	RES CARB. 1K0, 0.5J	R9
	5	ST	21	600004-073	RES CARB. 1K0, 0.5J	R12
	5	ST	21	600004-073	RES CARB. 1K0, 0.5J	R13
6	1	ST	21	206088-003	RES NETW 9 X 2K2 1/5G	R10
7	1	ST	21	206088-048	RES NETW 5 X 2K2 1/5G	R11
8	2	ST	24	207432-026	IC, --74LS245N	U2
	2	ST	24	207432-026	IC, --74LS245N	U1
9	1	ST	24	200498-006	IC, --74 37N 4X2IN NAND	U3
10	8	ST	31	BR451509	CONN PCB EDGE 36P FEMALE	X51
	8	ST	31	BR451509	CONN PCB EDGE 36P FEMALE	X52
	8	ST	31	BR451509	CONN PCB EDGE 36P FEMALE	X53
	8	ST	31	BR451509	CONN PCB EDGE 36P FEMALE	X54
	8	ST	31	BR451509	CONN PCB EDGE 36P FEMALE	X61
	8	ST	31	BR451509	CONN PCB EDGE 36P FEMALE	X81
	8	ST	31	BR451509	CONN PCB EDGE 36P FEMALE	X91
	8	ST	31	BR451509	CONN PCB EDGE 36P FEMALE	X101

BR471925 MOTHERB ASSY A12A1 RC40..

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 RC4010.

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 trouble shooting

WARNING

Read the Safety Summary at the front of this manual before trouble shooting the RC4010.

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 8.3) 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

Self test is activated by selecting program 49. The built-in test program goes through the following sequence:

a) The remote address will be shown 2.5 sec. and then the software version number.
Press enter to continue.

b) Software Option displayed. "0000000" indicate no option.
Press enter to continue.

c) Key test. Pressing any key but enter results in the hexadecimal value of the key being shown, see table 8.2.
Press enter to continue.

d) Display and led test. All led's and segment's are lit.
Press enter to continue.

e) Real time clock test. The µp tests the real time clock, and displays "Err. A8 cloc." if an error has been recognized.
Press enter to continue.

f) Assembly test. The µp addresses the modules to see whether they are present. If any module does not acknowledge the call, the µp displays e.g. "no A9" and then continues the test (A5.1 -A5.4 indicate A5 module no. 1-4).
Press enter to end test.

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 RC 4010.

The pushbutton switches in this RC4010 were designed for long, troublefree 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 four screws holding the front panel. The four screws are located at the exterior side of the RC4010 side profiles.
b) carefully withdraw the front panelassembly and disconnect the ribbon cable connector from the mother-board.
c) to reinstall the front panel assembly, reserve removal procedure.

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 RC4010 side profiles.

b) Disconnect all cables running to the concerned assembly.

c) 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.

d) To reinstall the assembly, reverse removal procedure.

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 build-up. 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 safely to be 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 accumulate 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 build-up 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 RC4010 uses two different families of logic circuits: MOS, and TTL. Most of the logic devices used in this RC4010 are TTL and are represented by unmarked logic symbols on the schematics. Logic elements, not belonging to 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 RC4010.

Table 8.1 Typical Logic Levels

Logic Family	High Level	Low Level
TTL	3 - 5V	0.2V
MOS	5 - 15V	0V

8.11 Basic Principles of Operation

The following paragraphs contain funcional 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 RC4010 is shown in Figure 8.1.

The microcomputer assembly A8 performs the overall control of the Receiver controller.

Typical tasks handled by the assembly:

- Control of the individual assemblies.
- Keyboard reading.
- Display refreshing.
- Programmable memory set-ups.
- 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.
The remote assembly A9 performs the remote control communication under control from the microcomputer.
The audio signals is selected by the audio A5 modul.

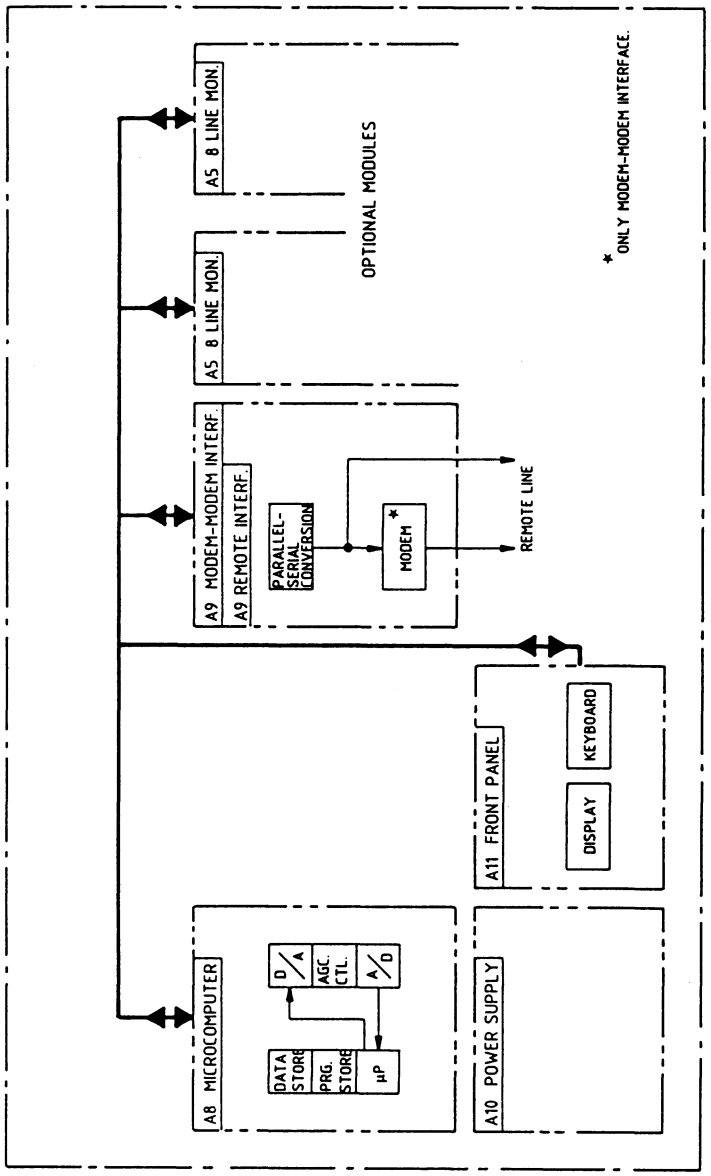


figure 8.1 Overall Functional Block Diagram.

8.13 8-line monitor assembly

The functional block diagram of the 8-line monitor Assembly is shown in Figure 8.2.

1. Inputs and outputs.
   Spikes and overvoltage protection of inputs and outputs.

2. Line switches
   Line switching according to address decoded line number.

3. Level conversion
   Q1 true Q7 performs logical inverting and level converting.

4. Address decoding
   U2 detects and decodes addresses for 8-line monitor service, and if correct address is recognized, acknowledge is signalled on the output of the U6 open collector buffers. The selected line address is further latched by U3, and the binary value converted to decimal by U1.

5. Muting.
   If zero address according to no active RX4010, is detected, the AF line is muted by U10.

6. Lowpass filter.

7. Highpass filter.

8. AF amplifier.
   AF amplifier with gain select (S1).

9. Balun.
   Transformation from balanced telephone line to unbalanced amplifier input.

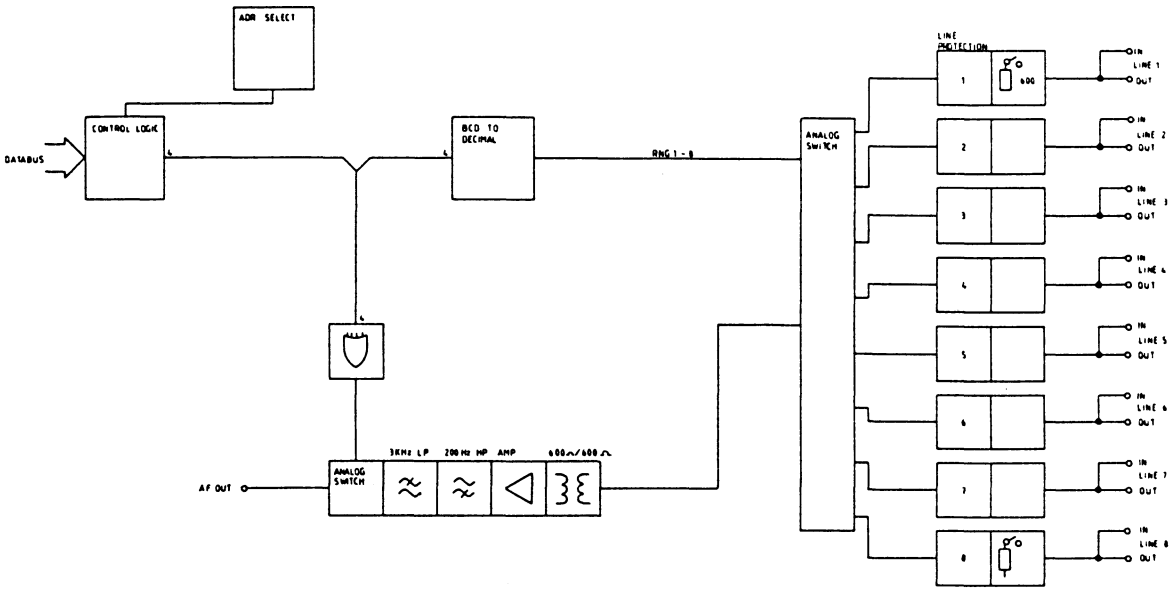


Fig 8.2 8-line monitor assembly

8.14 Microcomputer Assembly A8

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

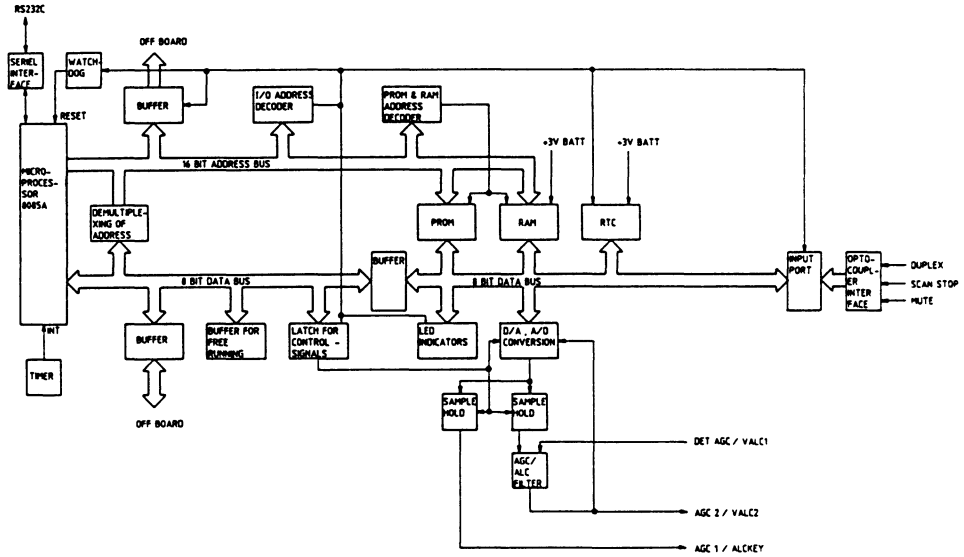


Figure 8.3 Microcomputer Assembly

The assembly consists of a 8085 microprocessor largescale integrated circuit that controls all basic functions within the RC4010.

The operating system software for the microcomputer is stored in three programmable read-only memories (PROM's). Each PROM is capable of storing 16K x 8-bit words.

A random access memory chip (RAM), capable of storing 8k x 8-bit words, is required for the temporary storage and manipulation of input and output data. During power failure and standby, the RAM is powered from a 3V battery backup preventing interruptions from disturbing the stored data.

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

A battery back-uped real time clock integrated circuit is mounted to ensure correct time keeping even during power failure .

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

8.15 Power Supply Assembly A10

The functional block diagram of the Power Supply Assembly is shown in Figure 8.4 for the AC only version and in Figure 8.5 for the AC/DC version.

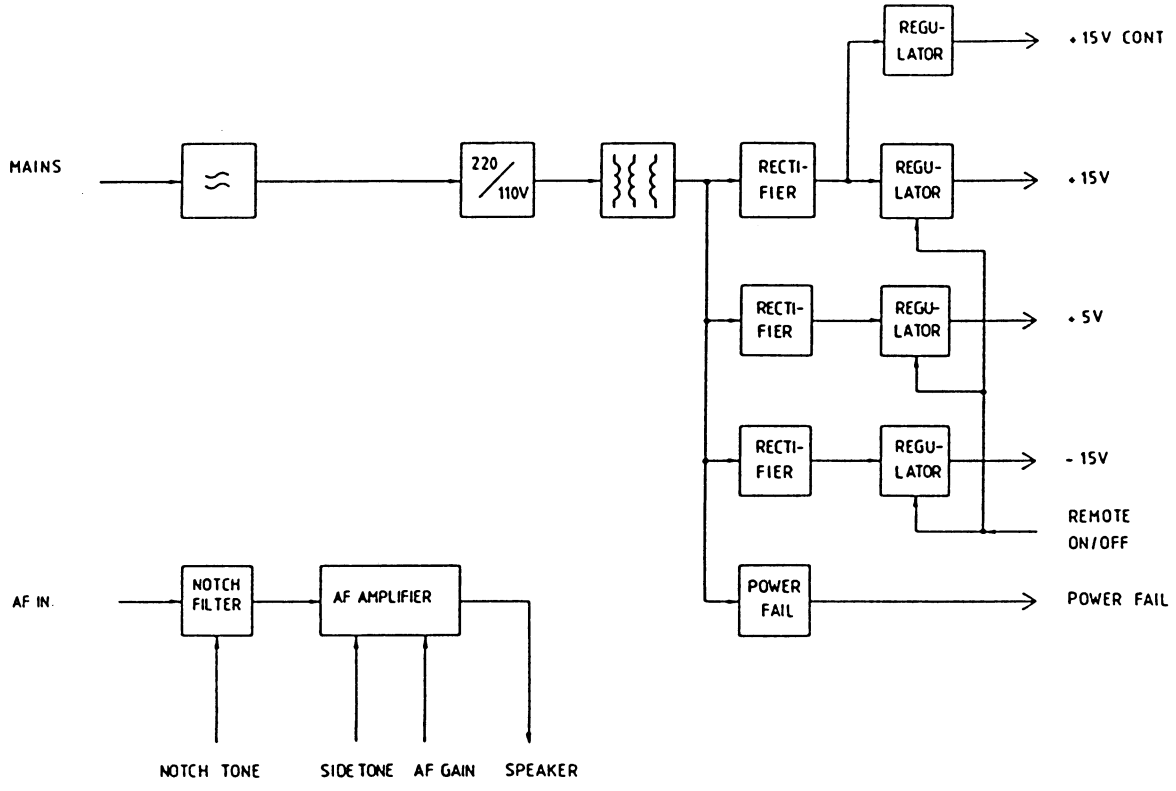


Figure 8.4 Power Supply Assembly. AC only version.

Part of the AF circuits, the notch filter and the AF power amplifier, are 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.

The AC/DC version (Figure 8.5) incorporates a floating inverter enabling the receiver to be driven by a 24Vdc source. The DC supply is converted to 80 Hz 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 relay, 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.

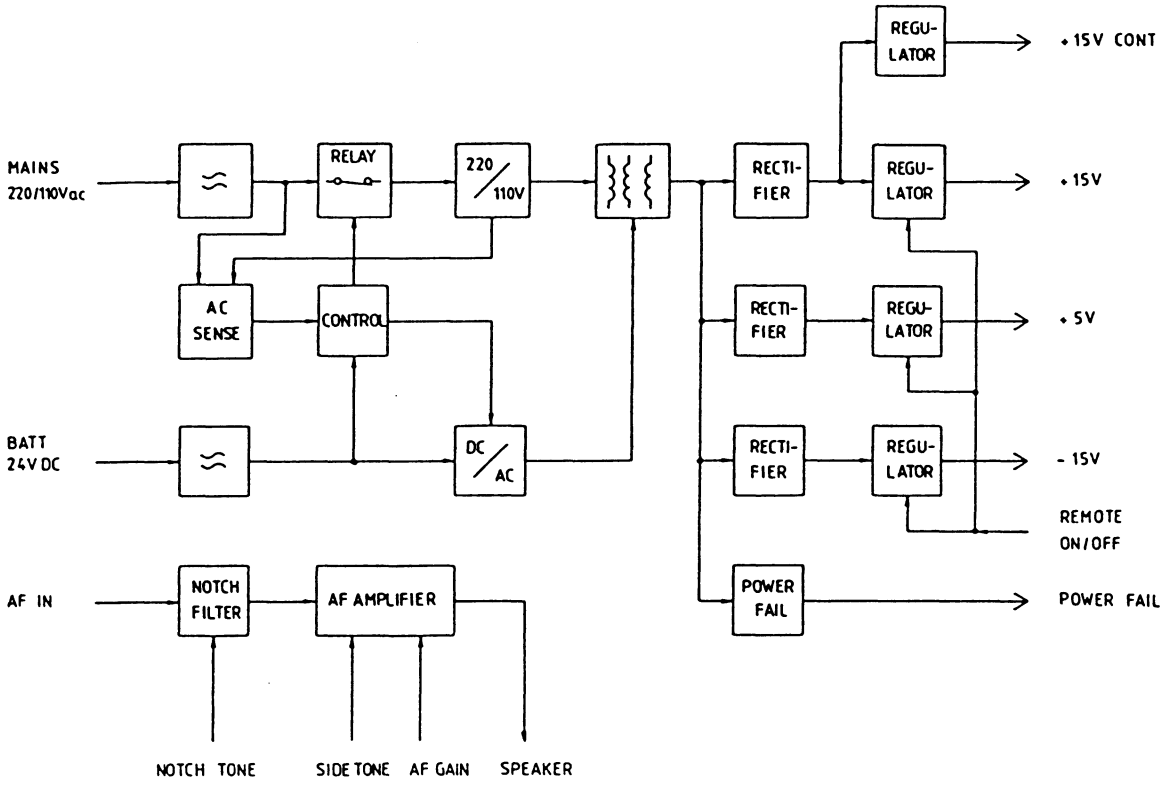


Figure 8.5 Power Supply Assembly. AC/DC version.

When the switch is turned off, the reference voltage for the regulators is grounded, causing the output voltages to be removed, while the remaining part of the assembly will continue to energize.

By means of an on/off switch positioned on the assembly rear panel the RC4010 may be de-energized. 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 to 3400 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.

8.16 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 LEDs, meter read-out, and phone connector are also mounted on this assembly.

All digital controlled pushbuttons, the tuning knob information and the digitized RF-gain setting are scanned by the Microcomputer Assembly. Synchronous the LED read-outs and the front panel meter are updated. The assembly incorporates A/D-D/A converters for converting the analogue RF-gain and meter information.

The only analogue 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 asembly to the RC4010 mother board.

8.17 Mother Board A12A1

The RC4010 mother board ties all parts of the RC4010 together. It routes the front panel controls, the microcomputer controls and the stabilized voltage to the remaining assemblies.

Table 8.2 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
.	8A
0	80
1	81
2	82
3	83
4	84
5	85
6	86
7	87
8	88
9	89
rcl	31
sto	30
addr	32
mon	33
progr	38

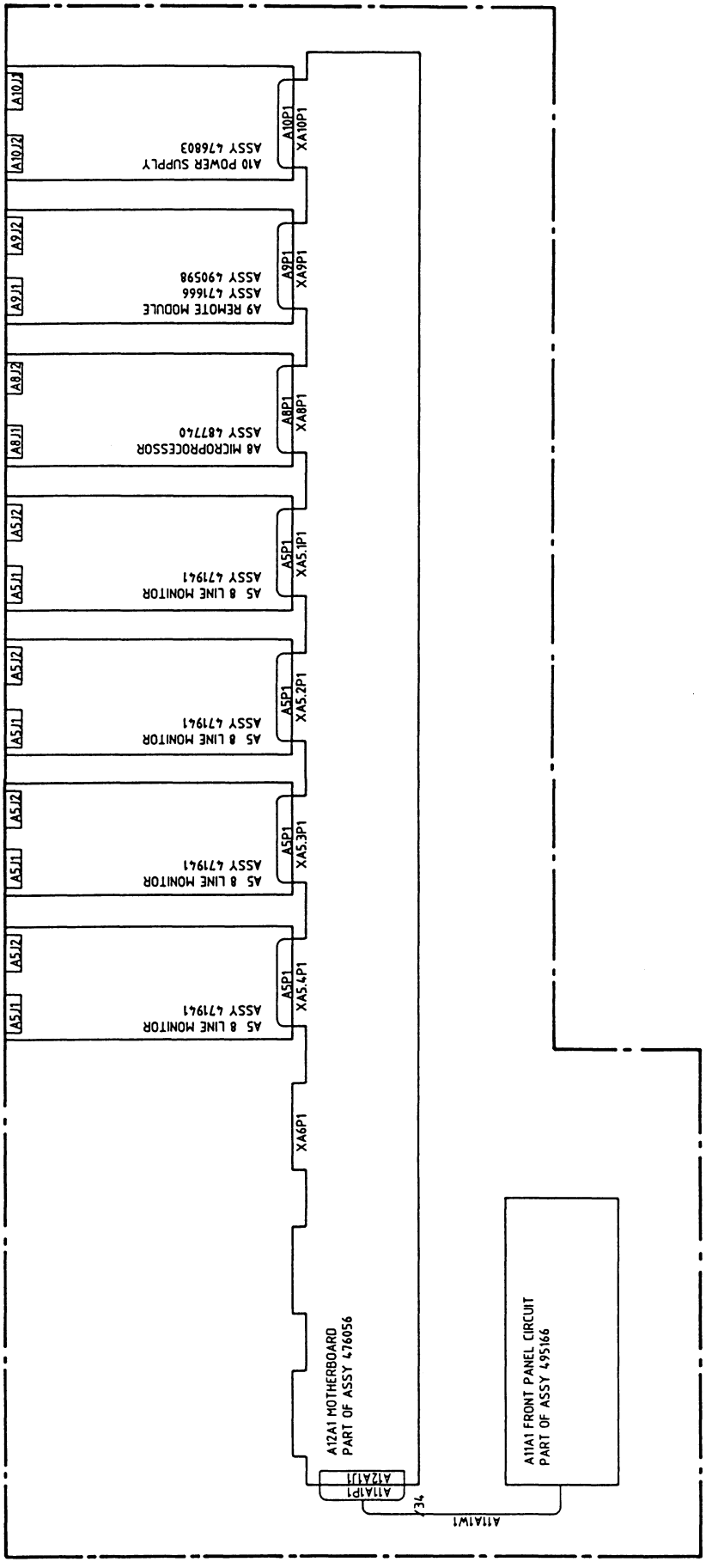
Table 8.3 Fault Analysis Procedures

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

SYMPTOM	POSSIBLE CAUSE
1. RC4010 dead. Mains OK Fuse not blown. No LEDs lit.	A10 Power Supply. A11 Front Panel. on/off switch.
2. RC4010 dead. Mains OK. Fuse blown and new fuse also blows	A10 Power Supply Diodes, seriestransistors, 75V Z-diodes
3. Front Panel dead. Noise is heard in the loudspeaker during power-up.	A8 Microcomputer A10 Power Supply 5V missing
4. Front Panel dead.	A11 Front Panel
5. Display very Weak. RC4010 else OK	A11 Front Panel Dimmer Circuit A10 Power Supply 8V missing
6. Part of Display lights extremely bright while the rest do not lit. RC4010 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 "bAt.FAIL" steadyly or periodically.	A10 Power Supply VBB, VEE or VFF drifting or incorrectly adjusted
9. The Display shows "Axx FAIL" during power-up.	Microcomputer inter face on Ax is faulty
10. "no Axx" during test program	Microcomputer interface on Axx faulty
11. RC4010 acts strange when pressing certain keys	A8 Microcomputer 8085 or EPROMs
12. RC4010 looses data in memory.	A8 Microcomputer Battery run out CMOS RAM faulty
13. "bAt.FAIL" during power-up	As 12.

Table 8.4 Remote transmission error codes.

Display	Error type	Explanation
r.Fr.	Received frames	Number is counting up for every 256 received frames.
r.bt.	Received bytes	Number is counting up for every 256 received bytes.
Syn.	Synchronousing retransmissions	The data is retransmitted 3 times, if there is no answer this error is counting up.
Hd.E.	Header error	a) More than 32 byte is received in a frame. b) There is not the correct number of data in the datatype. c) Datatype don't exist.
to.E.	Timeout error	The time between two frames is out of limit.
Fr.E.	Framing error	No stop bit is detected.
or.E.	Overrun error	The received byte is not read before a newone is received. Data lost.
Pt.E.	Parity error	The parity bit is not correct on the received byte
to.S.	Timeout on S110 line	No acknowledge received on



INTERCONNECTION DIAGRAM RC 4010 DWG.NO. 49 51 23

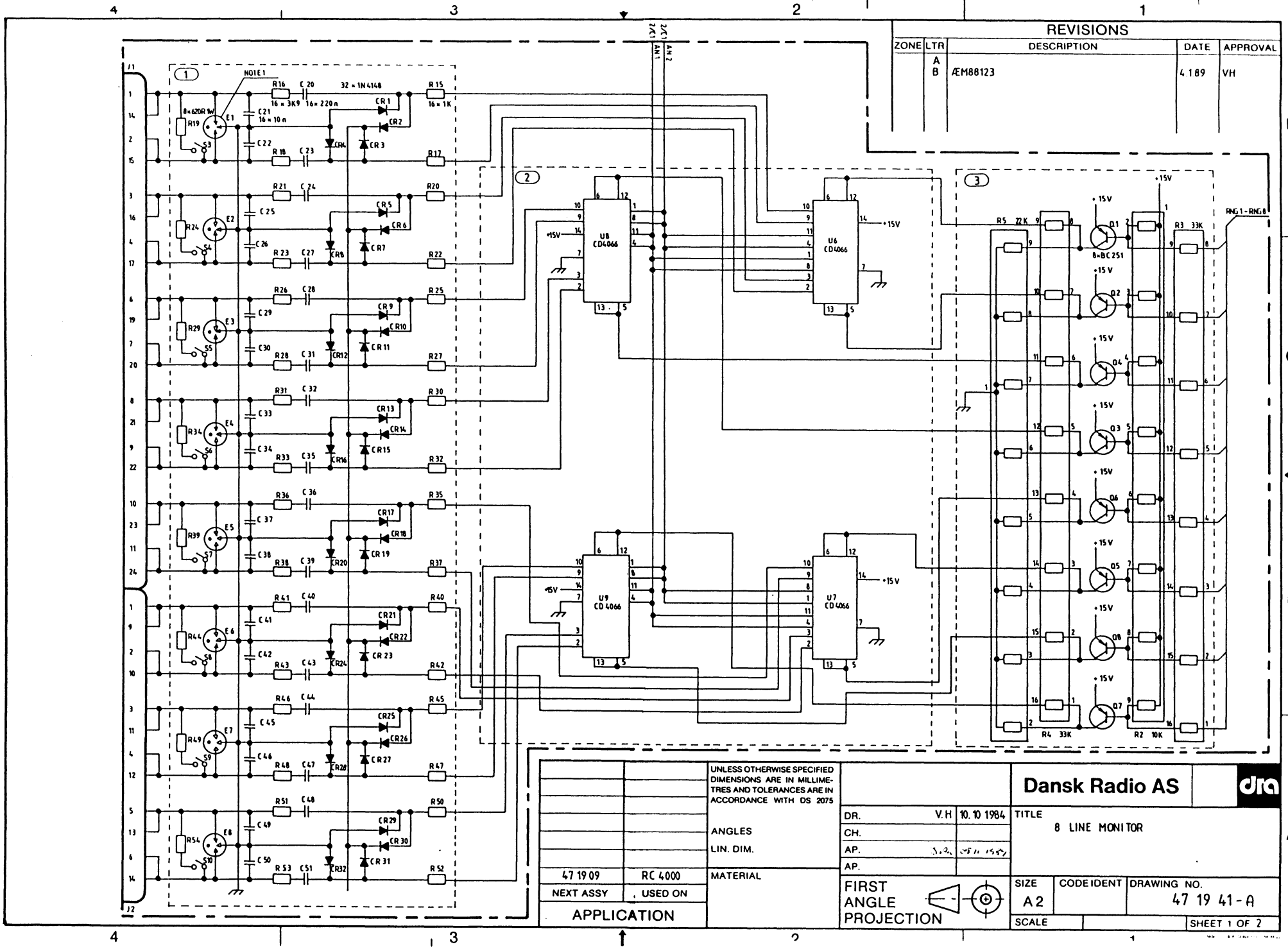
ASSY 471941, 8-LINE MONITOR

Service sheet A5

1. Input circuits.
Spike and overvoltage protection of the inputs. With S3 to S10 the impedance of the line inputs can be selected to 600Ω.

2. Line switches.
Line switching according to address decoded line number.

3. Level conversion.
Q1 thru Q7 performs logical inverting and level converting.


REVISIONS
ZONE | LTR | DESCRIPTION | DATE | APPROVAL
A
B | ÆM88123 | 4.1.89 | VH
Dansk Radio AS
TITLE
8 LINE MONITOR
DR. V.H 10.10 1984
CH.
AP.
AP.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075
ANGLES
LIN. DIM.
MATERIAL
47 19 09 | RC 4000
NEXT ASSY | USED ON
APPLICATION
FIRST ANGLE PROJECTION
SIZE A2
CODE IDENT
DRAWING NO. 47 19 41-A
SCALE
SHEET 1 OF 2
U8 CD4066
U6 CD4066
U9 CD4066
U7 CD4066
+15V
RNG1-RNG8
8=BC 251
R5 22K
R3 33K
R4 33K
R2 10K
Service Sheet A5

4. Address decoding.
U2 detects and decodes addresses for 8-line monitor service. When correct address is recognized, an acknowledge is signalled on the data bus thrugh U5 open collector buffers. The selected line address is further latched by U3, and the binary value converted to decimal value by U1.

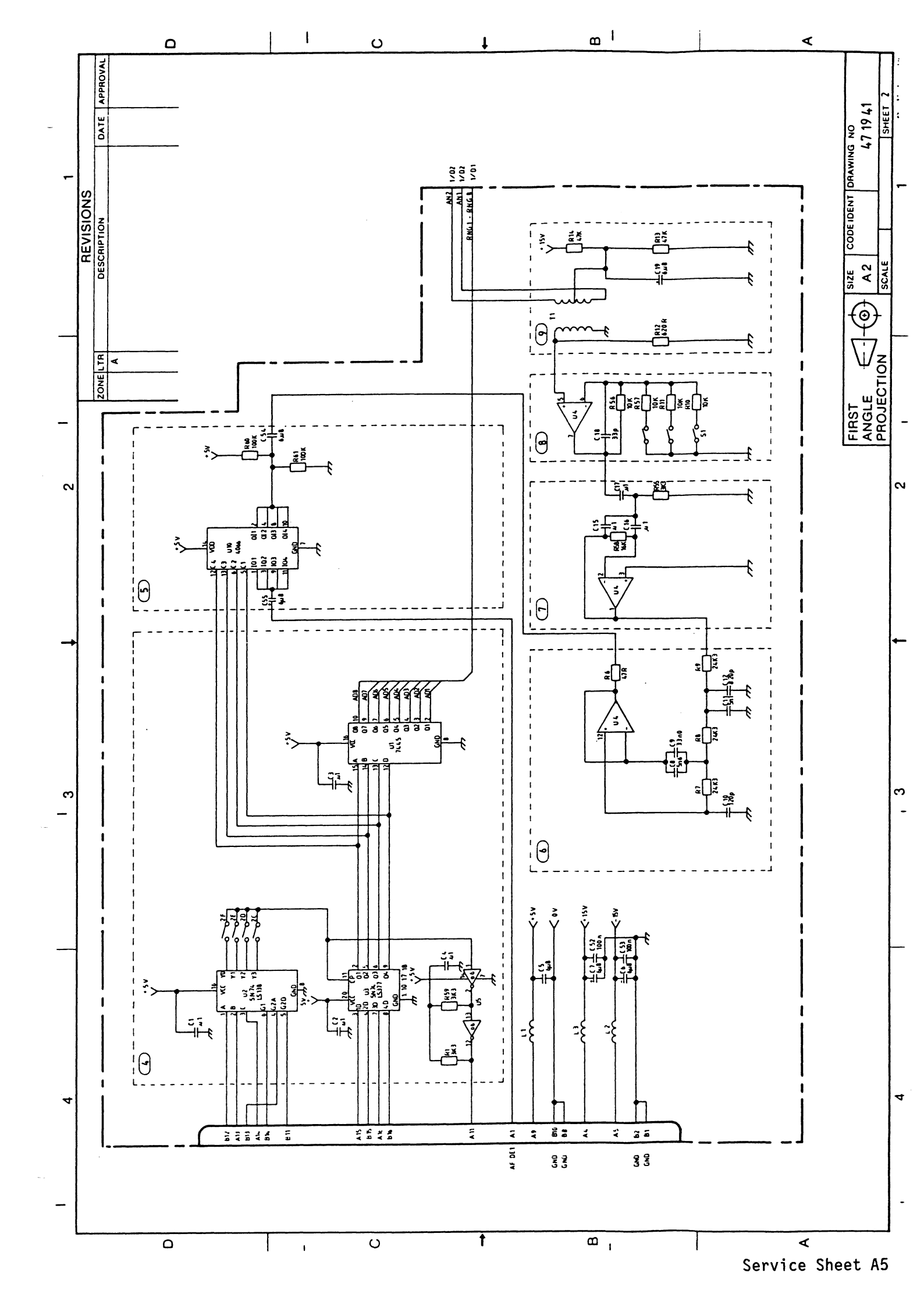
5. Muting.
If a zero address, corresponding to a non active RX4010, is detected, the AF line is muted by U10.

6. Lowpass filter.

7. Highpass filter.

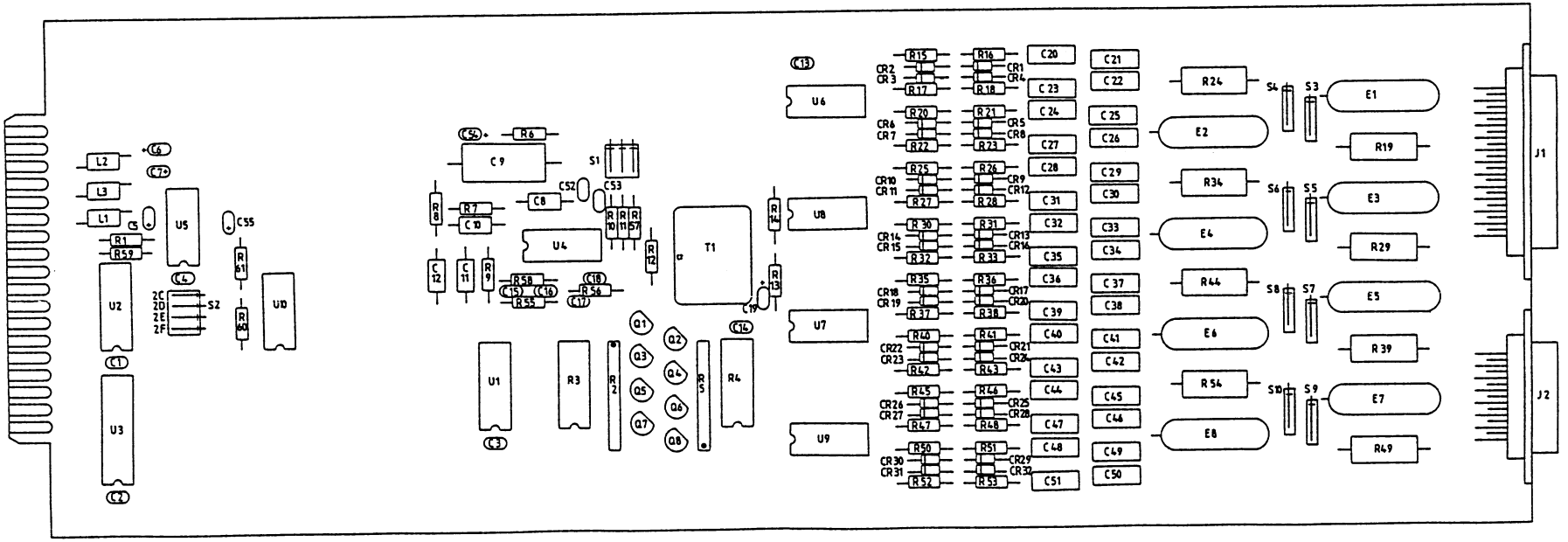
8. AF amplifier.
AF amplifier with selectable gain by means of S1.

9. Balun.
Transformation from balanced telephone line to unbalanced amplifier input.


REVISIONS
ZONE
LTR
DESCRIPTION
DATE
APPROVAL
A
SIZE
A2
CODE IDENT
DRAWING NO
471941
SCALE
SHEET 2
FIRST ANGLE PROJECTION

1. E1 - E8 : OPTIONAL

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	A	ÆO4535	24.2.90	VH
	B	ÆO4735	9411 02	ANK / dc
	B1			



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2975		Dansk Radio AS	dra
		ANGLES	DR. V.H 23.10 1984	TITLE 8-LINE MONITOR	
		LIN. DIM.	CH.		
			AP.		
47 1909	RC 4000	MATERIAL	AP		
NEXT ASSY	USED ON		FIRST ANGLE PROJECTION	SIZE A1	CODE IDENT
APPLICATION				SCALE	DRAWING NO. 47 1941 PD
					SHEET 1 OF 1

Service sheet A5

ASSY 487740, MICROCOMPUTER ASSEMBLY

Service Sheet A8

The assembly consists of an 8085 microprocessor large scale integrated circuit that controls all basic functions within the exciter.

The operating system software for the microcomputer is stored in three programmable read-only memories (PROM's). Each PROM is capable of storing 16K x 8-bit words.

A random access memory chip (RAM), capable of storing 8k x 8-bit words, is required for the temporary storage and manipulation of input and output data. During power failure and receiver standby, the RAM is powered from a 3V battery back-up preventing interruptions from disturbing the stored data.

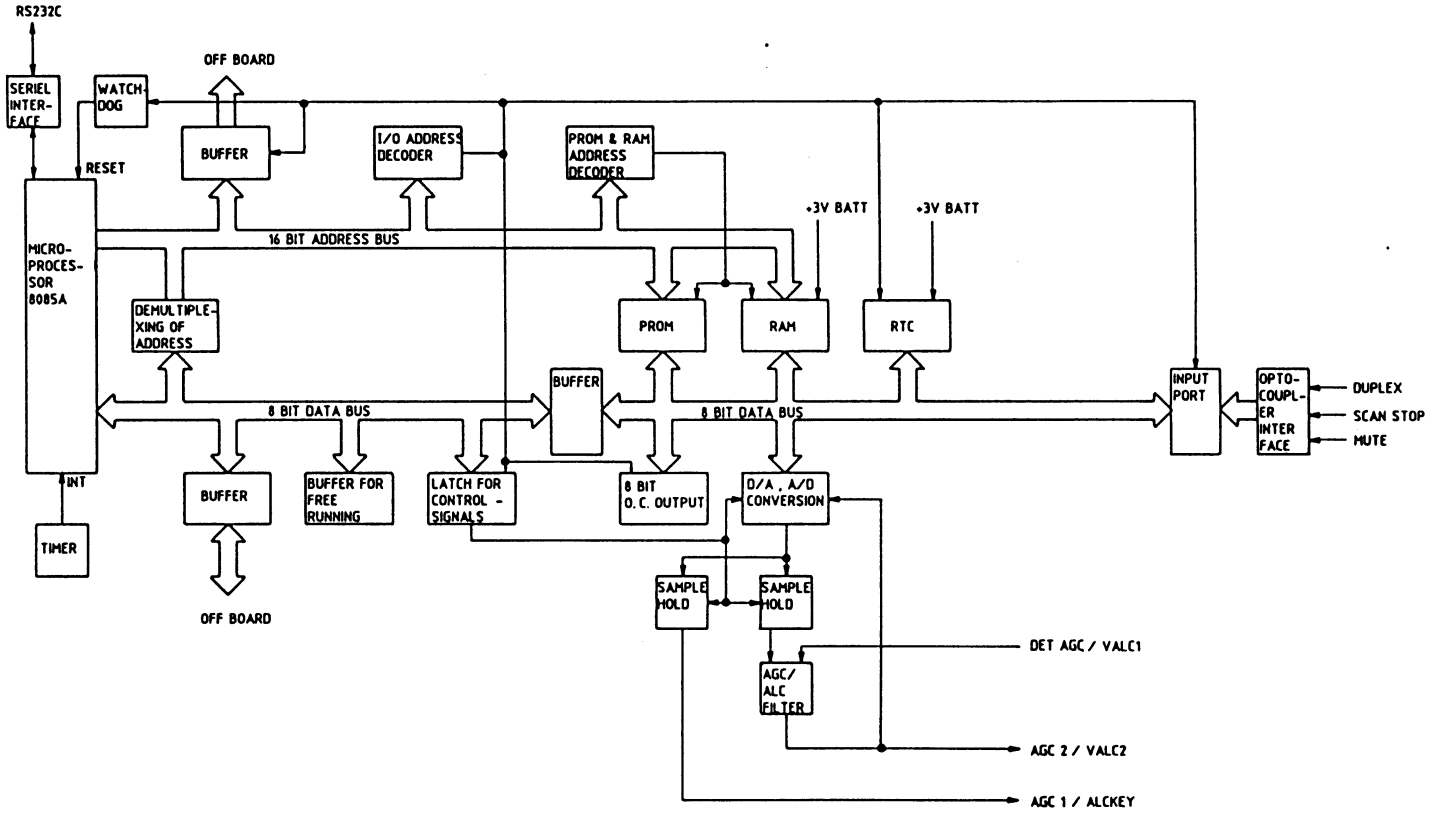
Various buffers and decoders assure proper drive levels and timing to and from various circuits and input/output ports.

A battery back-upped real time clock integrated circuit is mounted to ensure correct time keeping even during power failure or exciter standby.

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

The Microprocessor Assembly performs the automatic level control ALC. Analogue loops provides fast attack ALC-levels for the IF assembly. The peak voltage of **VALC1** is held by a sample and hold circuit. As long as **ALCKEY** is a logical "1", the microcomputer will approach **VALC2** to **VALC1**.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
		ÆM88110	18.11.88	VH
		ÆM89032	9.5.89	VH



471909	RC4000
471712	RX4000
488240	RX4009
488100	SE4010
NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075

ANGLES

LIN. DIM.

MATERIAL

DR.	VH	22.5.87
CH.		
AP.	NVF	11.05.87
AP.		

FIRST ANGLE PROJECTION

Dansk Radio AS

TITLE
CONFIGURATION
MPU BOARD
RC4000, RX4000, RX4009, SE4010

SIZE	CODE IDENT	DRAWING NO.
A2		48 77 40

SCALE | SHEET 1 OF 1

Service Sheet A8

Assy 487740, Microcomputer Assembly **Schematic 1**

1. Microprocessor Circuit

This circuit contains an 8085 microprocessor with associated 6.144MHz crystal for internal clock-stabilization. U12 is an eight bit latch for multiplexing address line **DB0** to **DB7**. U13 is a buffer for command signals etc.

2. Watch-Dog

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

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

U2 is a retrigger astable multivibrator with a period of 1sec. Under normal operation, the software ensure 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 the reset pulse generation will start-up.

3. 15msec No-Acknowledge Timer

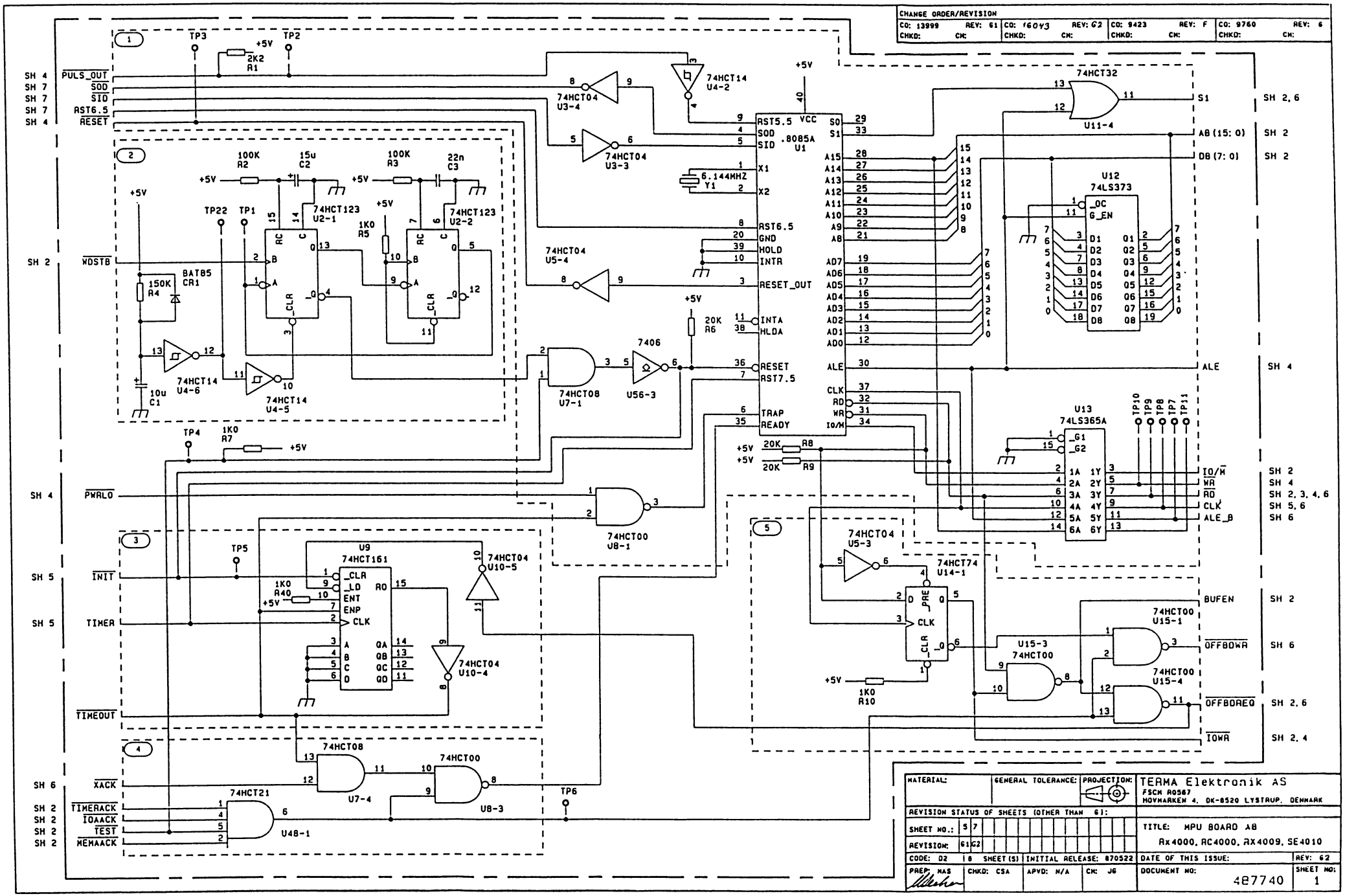
This timer starts counting when **OFF BD REQ** goes low. If the timer counts out, no acknowledge signal has been received within the last 15 msec, and a trap-interrupt is generated to the micro-processor. In normal operation, acknowledge signals should be received within 15 msec.

4. Acknowledge Network

The circuit converts the different acknowledge signals to a ready-signal to the microprocessor.

5. OFF Board Request

The J/K flip-flop U14 delays the start of the **WR**-signal one half of a clock period which ensures that **BUFEN**-signal delays the enable of buffer U17 in accordance with the timing. **OFF BD REQ** and **OFF BD WR** are only generated if no acknowledge signal on board has been received before start of **BUFEN**.



Service Sheet A8

6. Test Buffer
U16 is an 8 bit buffer which is enabled during "free-running", i.e. when **TEST** is low. When "free-running" is selected, U16 forces the microprocessor to read NOP-instructions, regardless of the microprocessor addressing.

7. Data Buffer
U17 is an 8 bit bidirectional data buffer which is enabled during on-board operations.

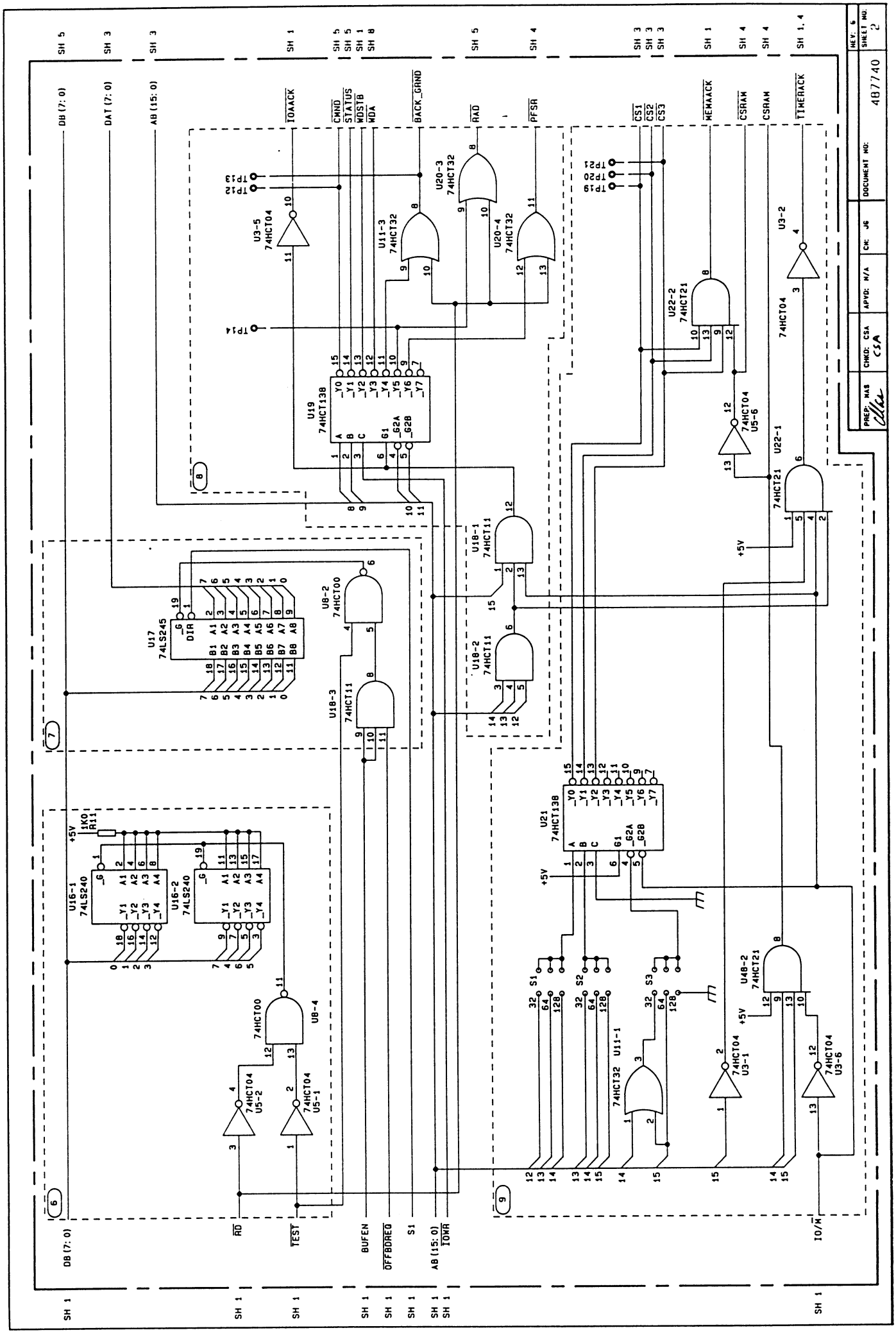
8. Internal Address Decoding
Address decoding for generating on-board chip selects for I/O operations. An acknowledge signal I/O AACK is generated for every
I/O-address, as handshaking signal to the microprocessor.

9. Address Decoding for Memory
Address decoding for generating on-board chip selects for memory
operations. An acknowledge signal MEM-AACK is generated for every
memory address, as handshaking signal to the microprocessor.

The S1, S2 and S3 strap fields determine the address range of CS1, CS2 and CS3

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

The address range from C000H to FFFFH is reserved for RAM memory.



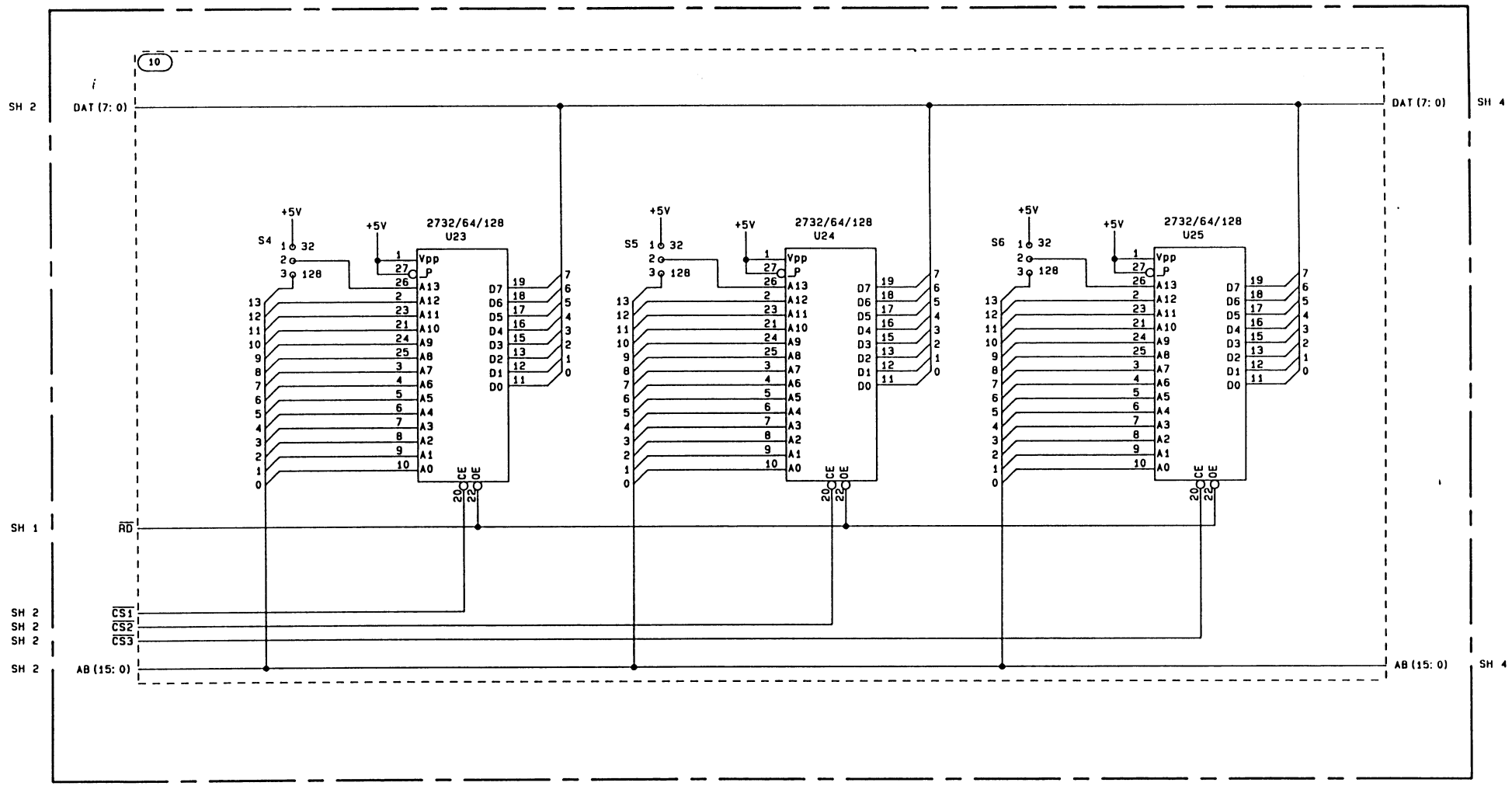
Service Sheet A8

10. EPROM Area

The contents of 2732 are 4K x 8 bit.
The contents of 2764 are 8K x 8 bit.
The contents of 27128 are 16K x 8 bit.

S1,S2,S3	S4	S5	S6	U23	U24	U25
32	32	32	32	2732	2732	2732
64	-	32	-	2764	2732	N.U.
64	-	-	32	2764	2764	2732
64	-	-	-	2764	2764	2764
128	128	32	-	27128	2732	N.U.
128	128	64	-	27128	2764	N.U.
128	128	128	-	27128	27128	2764
128	128	128	128	28128	28128	27128

(N.U. = not used).



STRAPPING:	S4	S5	S6
2732	1-2	1-2	1-2
2764	NA	NA	NA
27128	2-3	2-3	2-3

					REV: G
PREP: NAS	CHKD: CSA	APVD: N/A	CM: JB	DOCUMENT NO: 487740	SHEET NO: 3

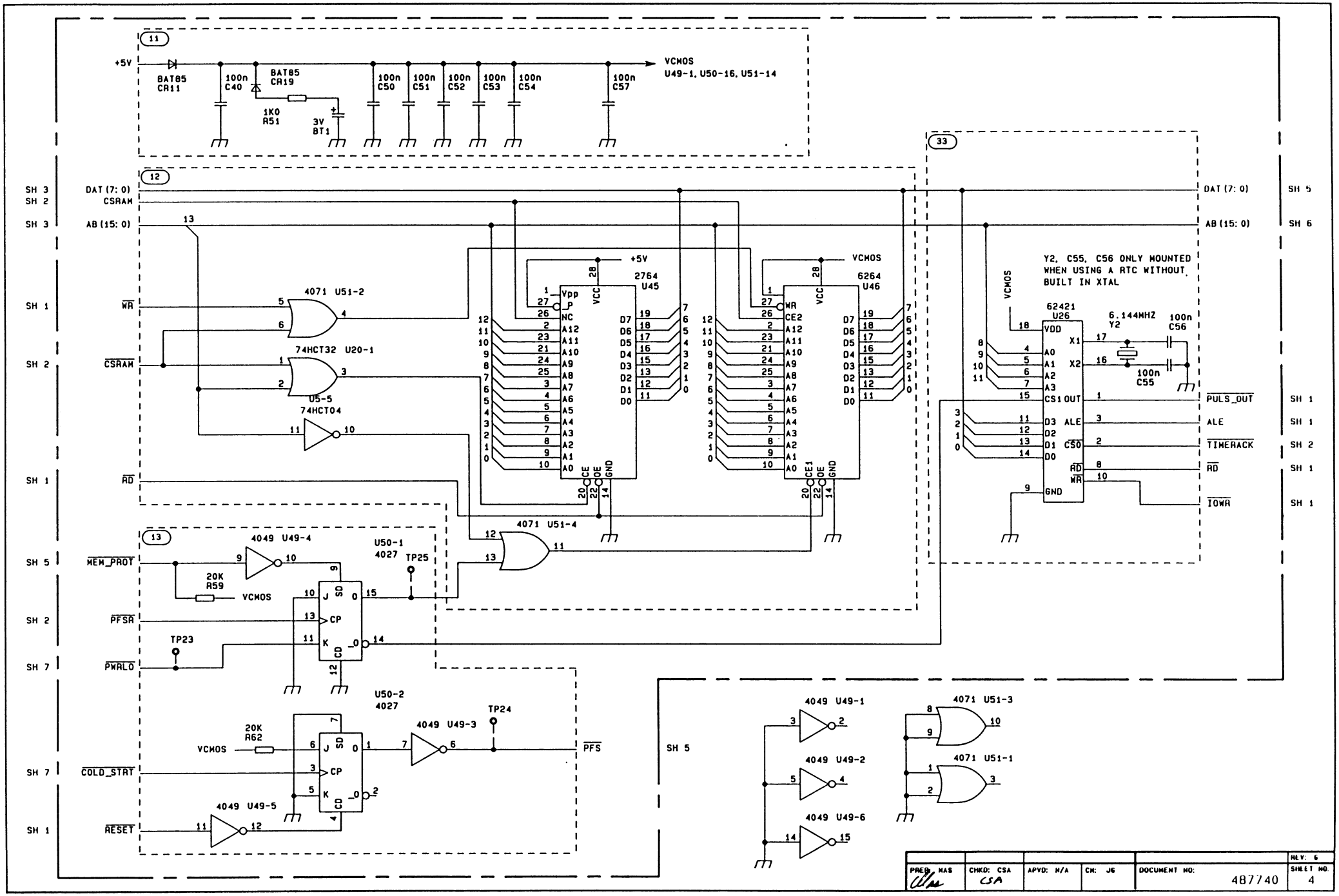
11. Back-Up Circuit
Circuit which ensures power to CMOS-gates U49-U51, CMOS-RAM U45 and U46 (if large RAM area is required) and RTC (U26) during power off.

BT1 is a lithium battery and R51 protects the battery against serious damage if a short circuit appears.

12. RAM Area
The RAM area consists of one 8K x 8 bit. The RAM area can be extended to 16K x 8 bit by placing an additional 8K x 8 bit RAM circuit in socket U46.
When U45 is used as RAM memory, the strap S8 must be strapped between a and b.
When large PROM memory is required, the strap S8 must be strapped between b and c. In this case, the U45 must be a PROM memory
and U46 must be a RAM memory.

13. RAM Protection
When power is removed intentionally by PWR OFF on the front panel, U50a is set. The **PWR LO** will interrupt the microprocessor. This will read the status of U50a and store relevant information in the CMOS RAM (U45 and U46) 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.

33. Real Time Clock
The real time clock consists of a battery back-upped integrated circuit U26. If the integrated circuit has a built-in oscillator crystal, the external components C35, C36 and Y2 are not mounted.



Service Sheet A8

14. 1msec Timer

This timer counts on the **CLK**-signal from the microprocessor. The output gives an RST 7.5 interrupt to the microprocessor for every 1ms, and a clock pulse to 3.

15. Input Buffer for Internal Signals

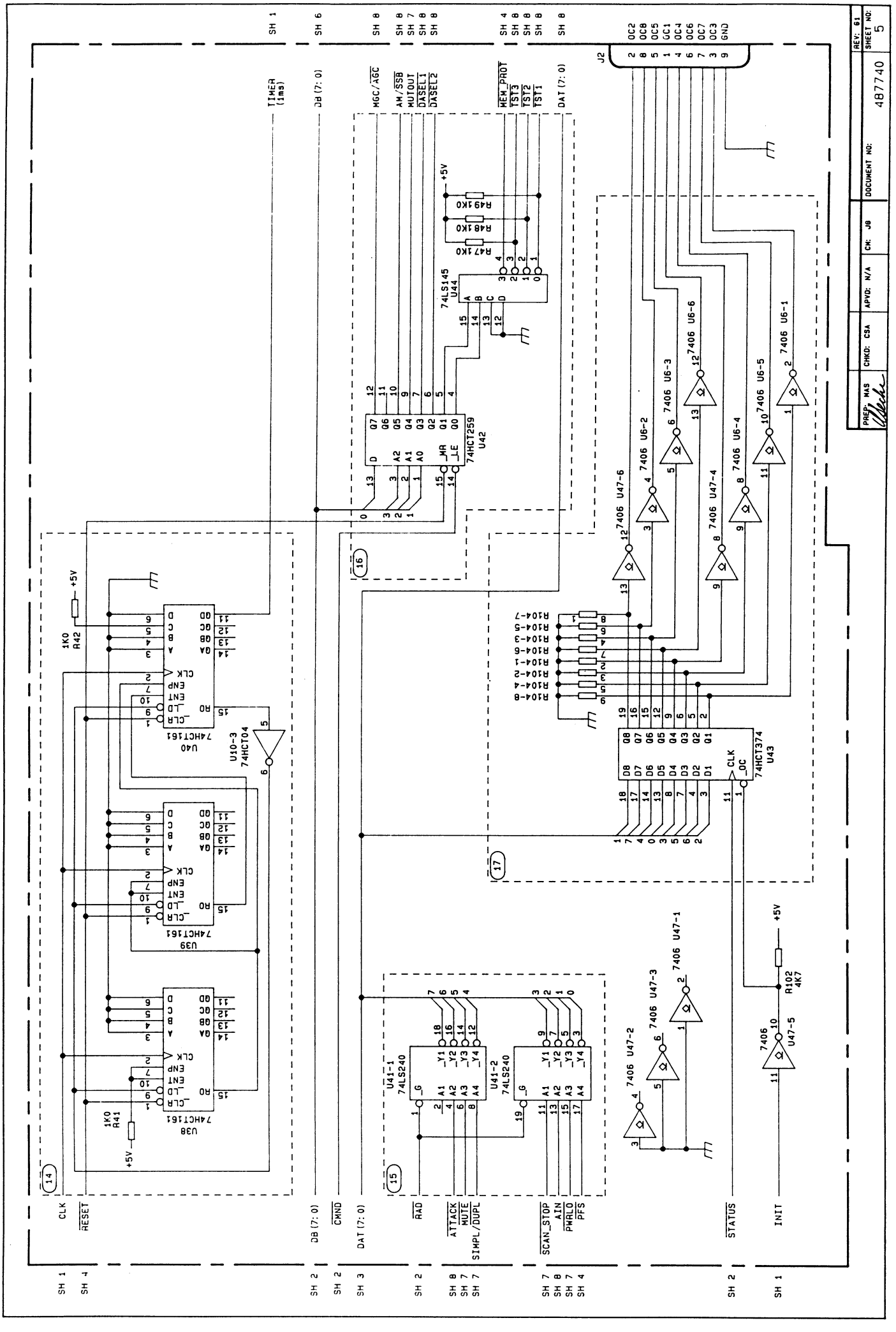
8 bit input port.

16. Control Latch

U42 is an 8 bit addressable latch used for control signals. U44 is a one out-of-four decoder with associated pull-up resistors used for control signals.

17. 8 bit Open Collector Output Circuit

Each output consists of an unprotected open collector inverter capable to sink max. 24 mA. The open collector voltage must not exceed 30 Volt. The 8 bit output is available via the connector J2 on the rear plate.

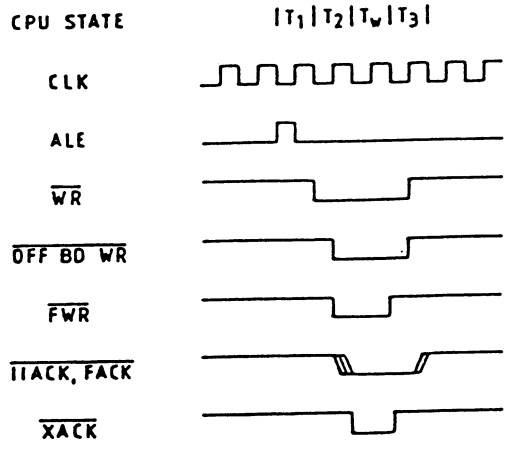


Service Sheet A8

18. Supply Filters

19. Off-Board Data Latch
U27 is an 8 bit bidirectional data bus buffer, which is enabled during off-board operations.

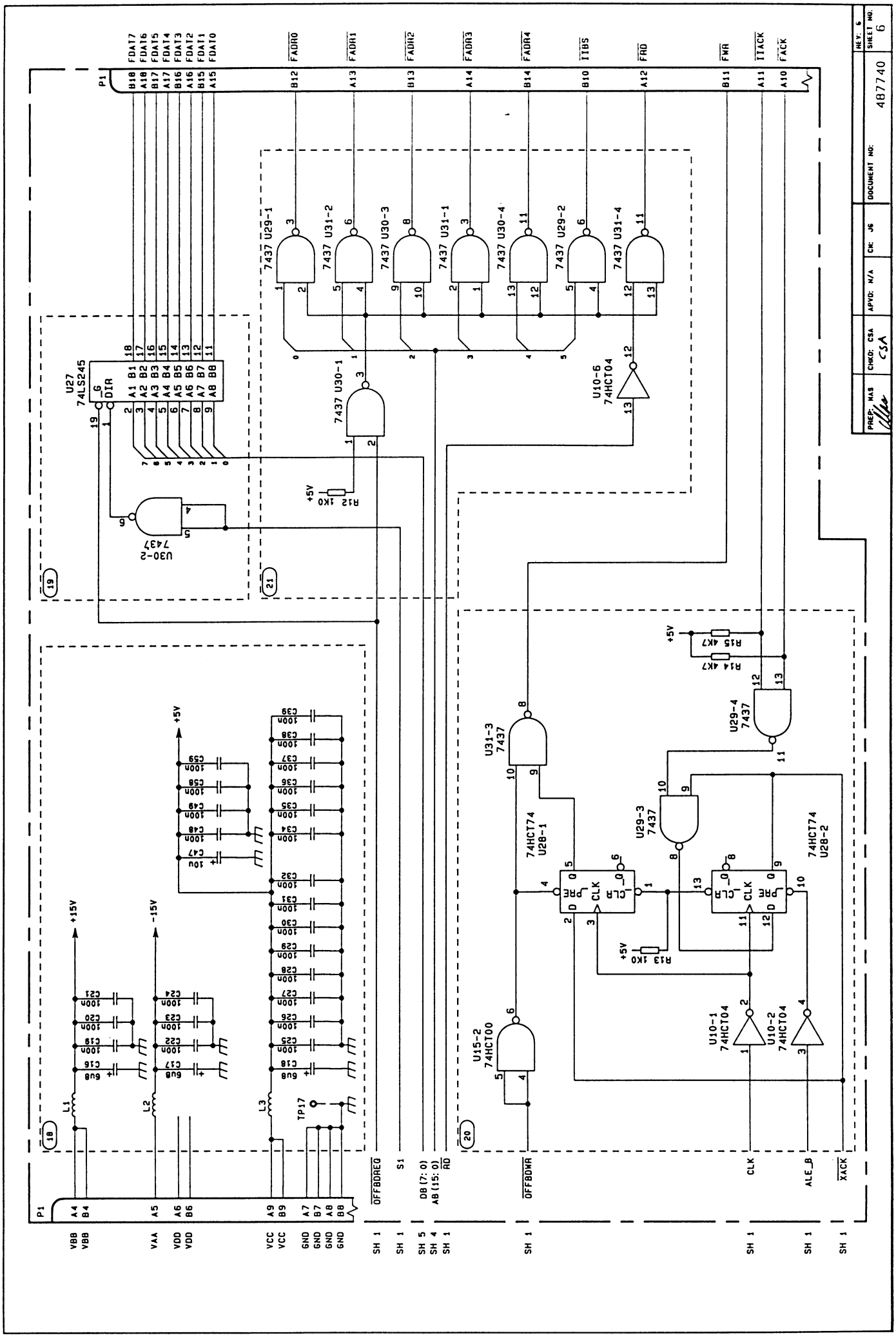
20. Off-Board Acknowledge
Circuit to provide at least 1 wait-state in the microprocessor timing, during off-board write operations. This ensures that data is valid on the rising edge of FWR.



Timing diagram for generating of 1 wait-state.

21. Off-Board Address Buffer
Buffers for Off-board address and command signals.

Service Sheet A8


P1
FDAT7
FDAT6
FDAT5
FDAT4
FDAT3
FDAT2
FDAT1
FDAT0
FADR0
FADR1
FADR2
FADR3
FADR4
ITBS
FRD
FWR
ITACK
FACK
7437 U29-1
7437 U31-2
7437 U30-3
7437 U31-1
7437 U30-4
7437 U29-2
7437 U31-4
U27
74LS245
DIR
U30-2
7437
7437 U30-1
U10-6
74HCT04
R12 1K0
+5V
R15 4K7
R14 4K7
U31-3
7437
U29-4
7437
U29-3
7437
74HCT74
U28-1
74HCT74
U28-2
R13 1K0
U15-2
74HCT00
U10-1
74HCT04
U10-2
74HCT04
+15V
-15V
L1
L2
L3
TP17
OFFBDREQ
S1
DB(7:0)
AB(15:0)
RD
OFFBDMA
CLK
ALE_B
XACK
VBB
VAA
VDD
VCC
GND
SH 1
SH 5
SH 4
PREP: MAS
CHKD: CSA
APVD: N/A
CM: JG
DOCUMENT NO: 487740
SHEET NO: 6

22. RS232 Interface (Optional)
RS232 interface for serial communication.

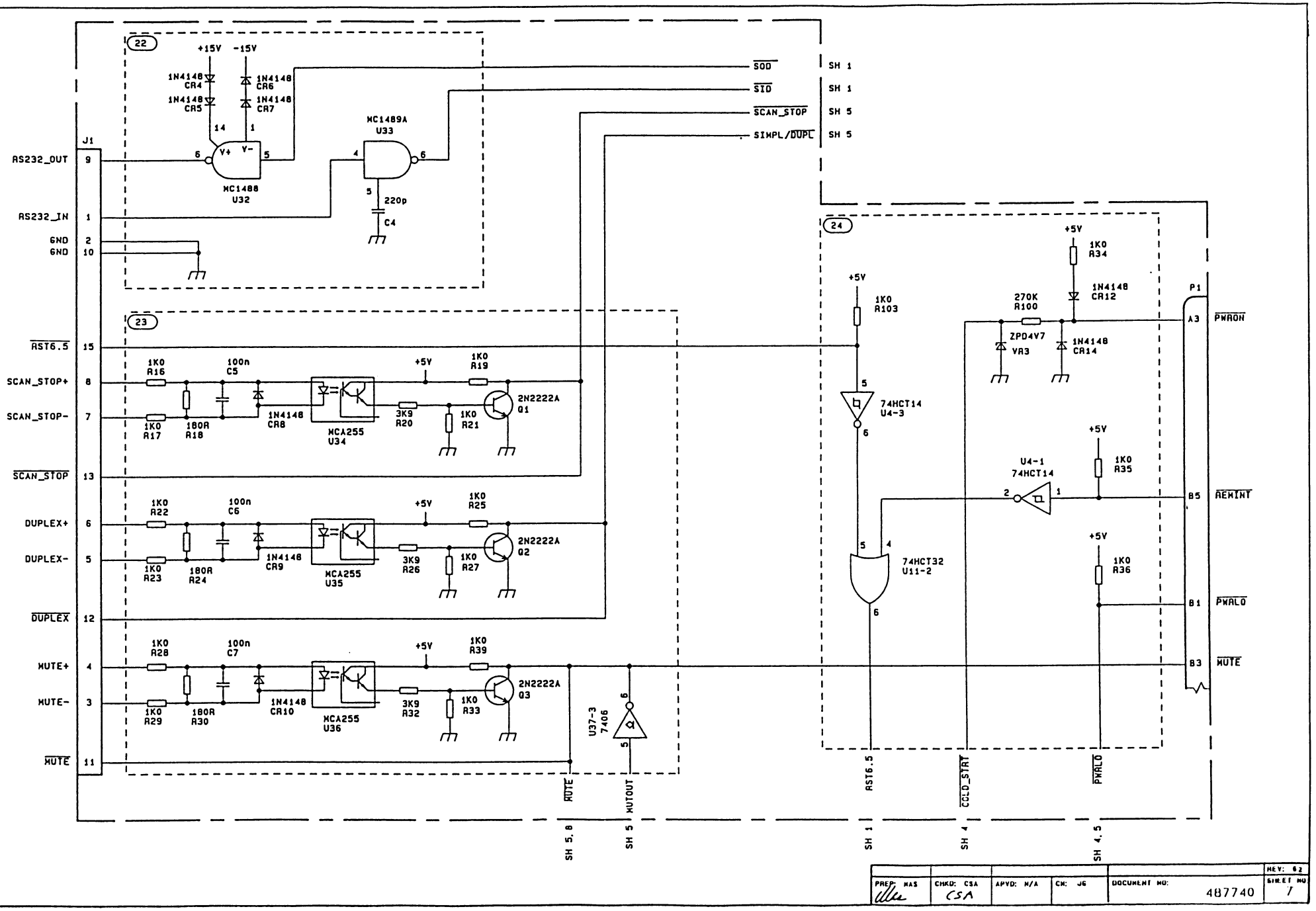
23. Optocoupler Interface
Octocoupler interface to ensure electrical separation between incoming signals and on-board signals.

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

The duplex input is used only in RX4010.

24. Power Control Inputs
Diode network CR13 and CR14 are protection diodes. R34 and CR12 ensure current through the connector when **PWRON** is low.

If power is removed by turning "PWR OFF" on the front panel, **PWRON** goes high, and enables U50a in 13 to be cleared, by means of **COLD STRT**.



Service Sheet A8

25. D/A Converter
U52 is an 8 bit latch. U53 is a bit digital to analogue converter with associated resistor network. U54 is an operational amplifier with an output to be range set by R67. The maximum output may be adjusted to 10V.

26. ATTACK Detector
Circuit to provide an **ATTACK** as long as Q9 is open. To avoid spikes to cause an **ATTACK**, R91, C10 determines the minimum time Q9 has to be open. R70, R71 and C10 holds the **ATTACK** to ensure the microprocessor to read the **ATTACK**.

27. MUTE Buffer
A MUTE Signal will force the AGC2/VALC2 and the AGC1/ALCKEY to +15 VDC. (Optionally).

28. Analogue Switch
U57 is an analogue switch. When the microprocessor assembly is used in SE4010 this switch will always be closed. CR23 protects U57 against negative levels.

29. Gain Control Filter/Strap
Only when the microcomputer assembly is used in SE4010, the strap S7 must be strapped between a and b. This will minimize the effect of the filter and cause the transfer function to equal 1 approximately.
Otherwise the strap S7 must be strapped between b and c.

If **VALC1/AGCDET** exceeds **Vhold** + Vbe (Q8) (**Vhold** is the voltage on the output of U54b) an **ATTACK** is fed to the microcomputer causing **Vhold** to increase.

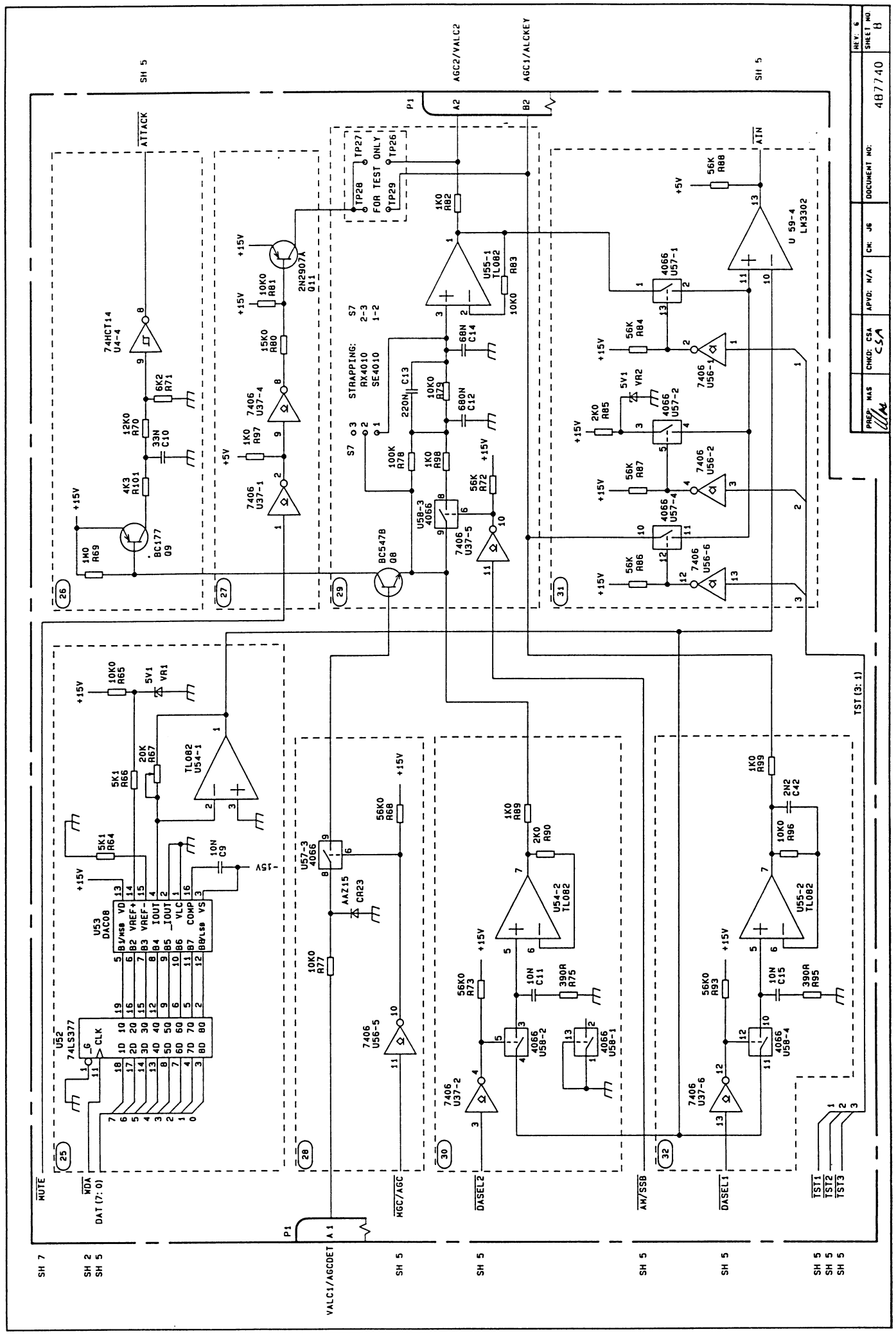
When used in SE4010 **Vhold** decreases slowly when no **ATTACK** is present provided that **AGC1/ALCKEY** is on logical "1".

When used in a receiver **Vhold** decreases according to the AGC time constants.

30. Sample and Hold Circuit for Vhold
Sample and hold circuit supplying **Vhold**.

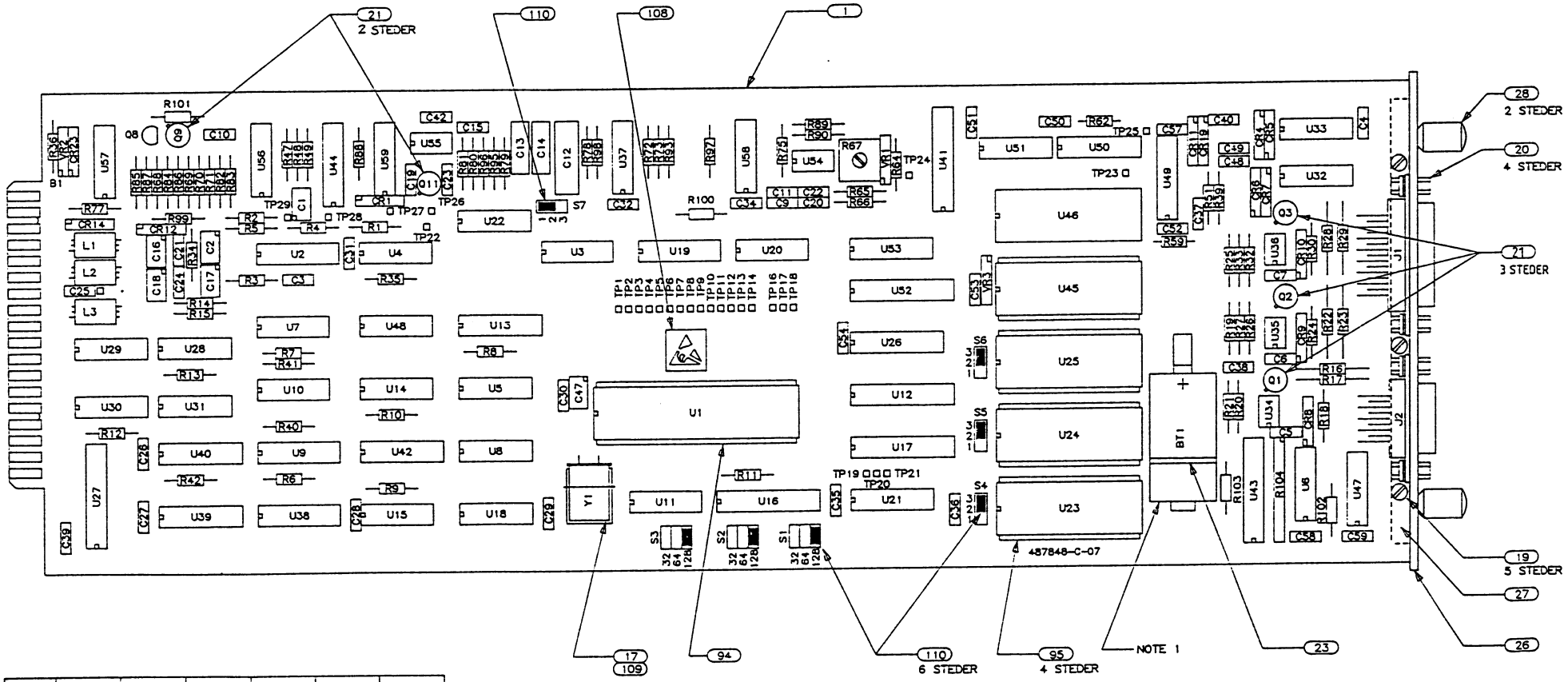
31. Test Circuit
By means of the comparator U59 and the D/A-converter in (25), an A/D-conversion of either **AGC1/ALCKEY**, **AGC2/VALC2** or a test level can be performed.

32. Sample and Hold Circuit for AGC1
When used in receivers the circuit supplies AGC-voltage to **AGC1**.


SH 5
ATTACK
AGC2/VALC2
AGC1/ALCKEY
SH 5
ATIN
P1
A2
B2
TP28
TP27
TP29
TP26
FOR TEST ONLY
74HCT14 U4-4
12K0 R70
6K2 R71
33N C10
4K3 R101
1M0 R69
BC177 Q9
+15V
+5V
7406 U37-4
7406 U37-1
1K0 R97
15K0 R80
10K0 R81
2N2907A Q11
1K0 R82
U55-1 TL082
R83
10K0
68N C14
STRAPPING: S7
RX4010 2-3
SE4010 1-2
S7
220N C13
10K0 R79
680N C12
100K R78
1K0 R98
56K R72
U58-3 4066
7406 U37-5
BC547B Q8
56K R88
U 59-4 LM3302
4066 U57-1
56K R84
7406 U56-1
5V1 VR2
2K0 R85
4066 U57-2
56K R87
7406 U56-2
4066 U57-4
56K R86
7406 U56-6
26
27
29
31
10K0 R65
5V1 VR1
20K R67
TL082 U54-1
5K1 R66
5K1 R64
10N C9
-15V
U53 DAC08
U52 74LS377
MUTE
WDA
DAT(7:0)
25
56K0 R68
U57-3 4066
AAZ15 CR23
10K0 R77
7406 U56-5
28
MGC/AGC
P1
A1
VALC1/AGCDET
1K0 R89
2K0 R90
U54-2 TL082
56K0 R73
10N C11
390R R75
4066 U58-2
4066 U58-1
7406 U37-2
30
DASEL2
TST(3:1)
1K0 R99
2N2 C42
10K0 R96
U55-2 TL082
56K0 R93
10N C15
390R R95
4066 U58-4
7406 U37-6
32
AM/SSB
DASEL1
TST1
TST2
TST3
SH 7
SH 2
SH 5
SH 5
SH 5
SH 5
SH 5
SH 5
SH 5
SH 5
PREP: MAS
CHKD: CSA
APVD: N/A
CH: J6
DOCUMENT NO: 487740
REV: 6
SHEET NO 8

CHANGE ORDER/REVISION			
CO: 13999 REV: K2	CO: 17510 REV: K3	CO: 17813 REV: K4	CO: 18076 REV: K5
CHKD: CM: CSA	CHKD: CM: JG	CHKD: CM:	CHKD: CM:

1. BT1 (BATTERY) LODDES PA - POL
   + POL MA IKKE HAVE FORBINDELSE.
   + POL PALODDES NAR MODUL MONTERES I UNIT.
   THE + POLE OF THE BATTERY IS SOLDERED
   TO THE CIRCUIT AT DELIVERY.



PROM	S1	S2	S3	S4	S5	S6
2732	POS 32	POS 32	POS 32	POS 1-2	POS 1-2	POS 1-2
2764	POS 64	POS 64	POS 64	-	-	-
27128	POS 128	POS 128	POS 128	POS 2-3	POS 2-3	POS 2-3

= STANDARD STRAP

STRAPPING OF S7	
SE4010	POS 1-2
RX4010	POS 2-3

= STANDARD STRAP

MATERIAL:	GENERAL TOLERANCE:	PROJECTION:	TERMA Elektronik AS
			FISKN RO567 HOVMARKEN 4, DK-8520 LYSTRUP, DENMARK
REVISION STATUS OF SHEETS (OTHER THAN K1):			
SHEET NO.:			TITLE: COMPONENT LOCATION MPU BOARD A8
REVISION:			
CODE: D2	1 SHEET(S)	INITIAL RELEASE: 900118	DATE OF LATEST REV.: 940628 REV.: K5
PREP: IN	CHKD: CSA	APVD: N/A CM: JG	DOCUMENT NO.: 487740 SHEET NO.: 1

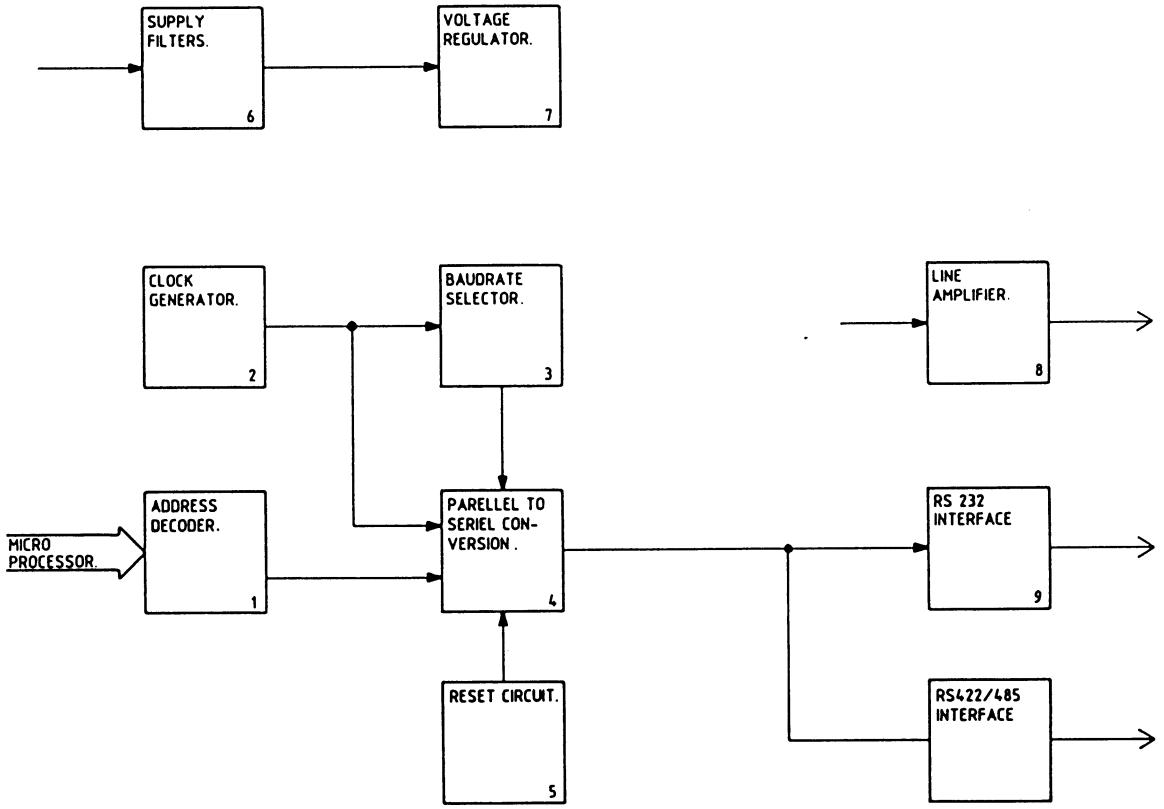
Service Sheet A8

ASSY 490598, INTERFACE RS232/422/485

Service Sheet A9

The clock generator (2) running at 6.144 MHz delivers clock pulses to the parallel to serial conversion circuit (4) with a frequency of 1.2288 MHz. The baudrate generator (3) controls the baudrate of the remote communication. The parallel to serial conversion circuit (4) interfaces the serial data bus to an 8-bit data bus which is controlled by the microprocessor of the equipment via the address decoder (1). The serial data bus is converted to RS232C, RS422 or RS485 levels in the interface circuits. A balanced line output (8) is available when the module is installed in an RX4010 receiver.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL



NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075		Dansk Radio AS	dra
APPLICATION		ANGLES	DR. VH 11.1 1988	TITLE MODULE CONFIGURATION INTERFACE RS232/422/485	
		LIN. DIM.	CH.		
			AP. 28 11.1.1988		
		MATERIAL	AP.		
			FIRST ANGLE PROJECTION	SIZE A2 / CODE IDENT / DRAWING NO. 49 05 98-A	
				SCALE / SHEET 1 OF 1	

Service Sheet A9

Assy 490598, Interface RS232/422/485 **Schematic 1**

1. Control/Data Interface

This circuit controls the data transmission between the CPU card (A8) and the interface card (A9).
The card is controlled through 3 ports, each having an address decoded by U6.

Address	Function
02H	UART command port
03H	UART data port
0CH	equipment address in port

A handshake signal (FACK) is sent to A8, when a port is addressed.
U14 is a hex bus driver for the remote address of the receiver.

2. System Clock

U1 forms a clock generator running at 6.144 MHz. U2 divides this by 5 to obtain a clock to the UART.

3. Baudrate Generator

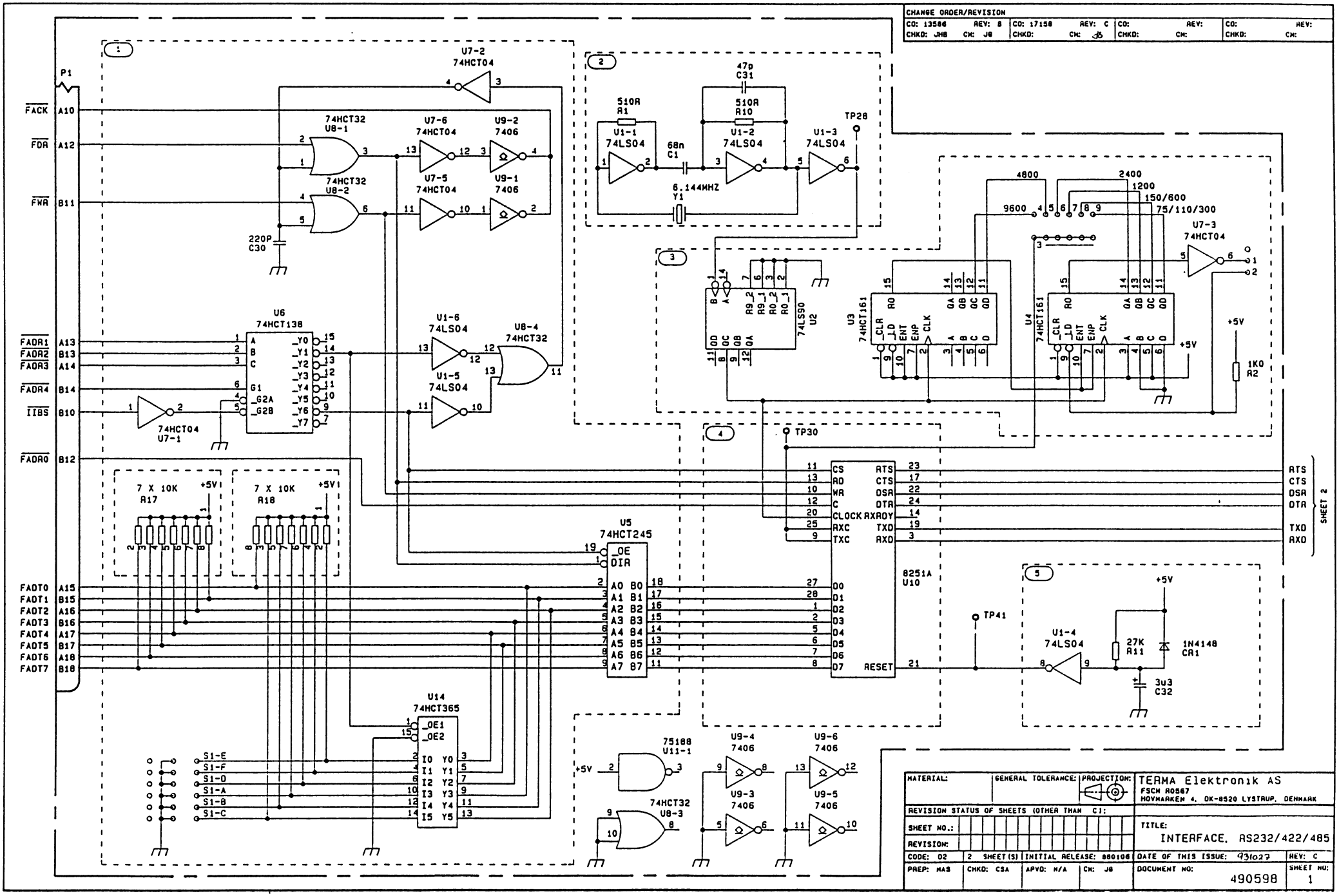
The baudrate generator consists of dividers U3 and U4 giving the receive/transmit clockrate at 16 times the baudrate determined by the straps.

4. UART

Controlling the serial data transmission and associated control signals.

5. Power on Reset

Generates a power on reset pulse to the UART.



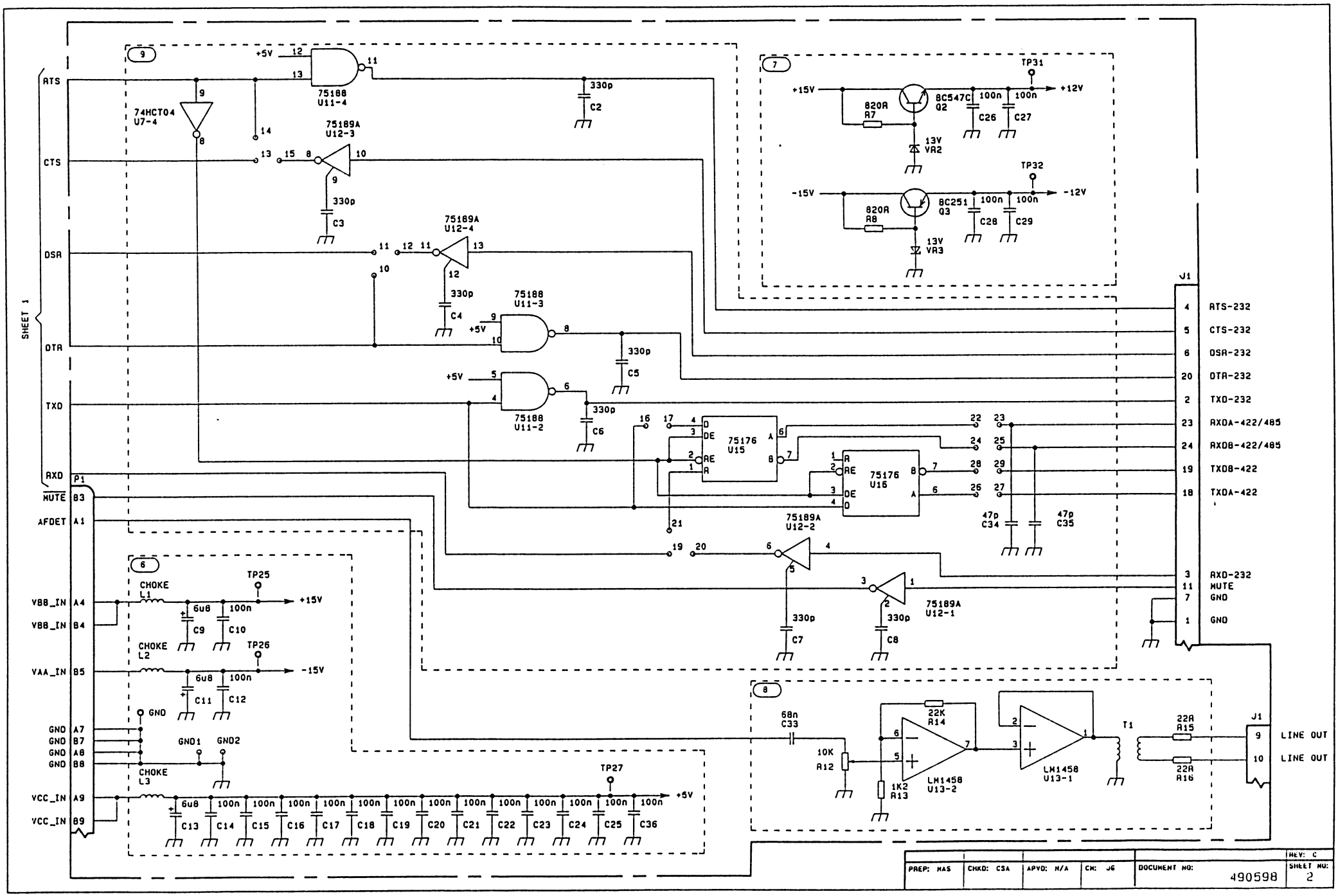
Service Sheet A9

6. Supply Filters

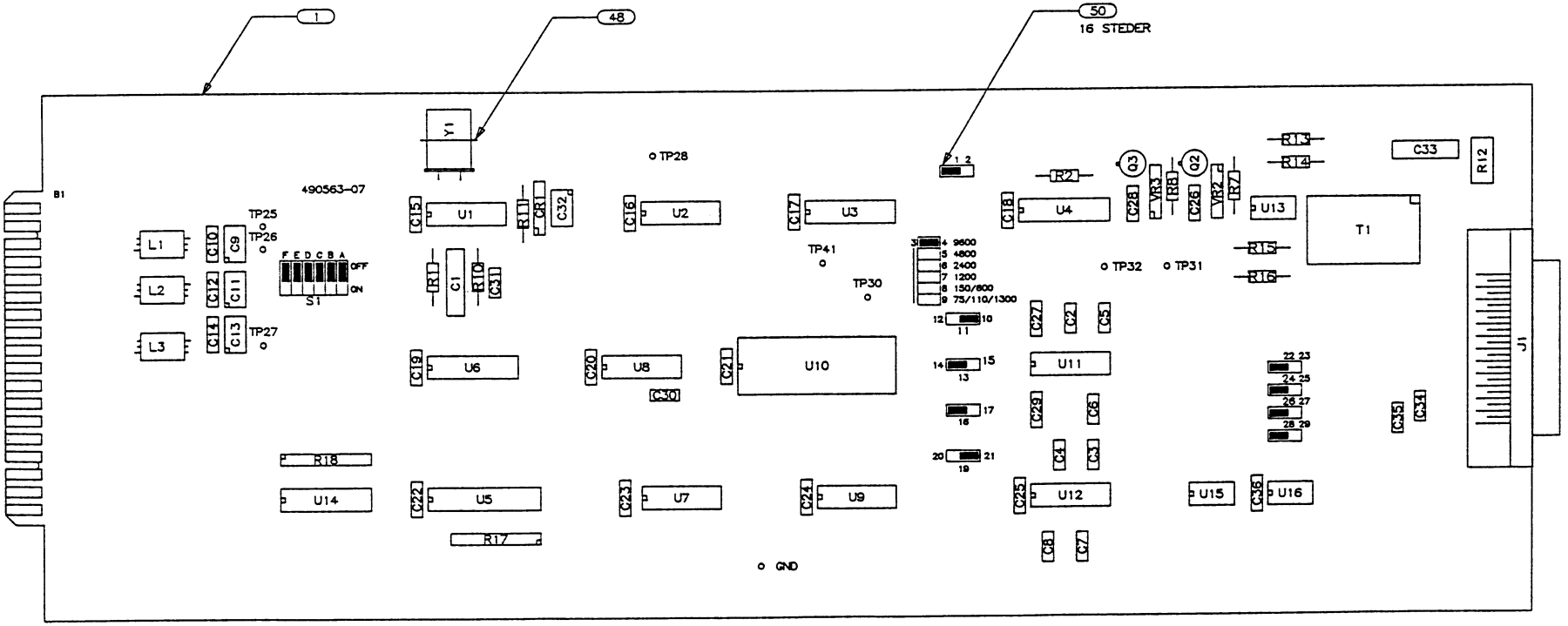
7. Voltage Regulators for +12V and -12V Voltages

8. Line Amplifier with Variable Gain

9. Data Driver/Receiver
Data drivers and receivers for RS232, RS422 and RS485 data busses.


SHEET 1
RTS
CTS
DSR
DTR
TXD
RXD
MUTE
AFDET
VBB_IN
VAA_IN
VCC_IN
GND
74HCT04 U7-4
75188 U11-4
75189A U12-3
75189A U12-4
75188 U11-3
75188 U11-2
75176 U15
75176 U16
75189A U12-2
75189A U12-1
LM1458 U13-2
LM1458 U13-1
+5V
+15V
-15V
+12V
-12V
330p C2
330p C3
330p C4
330p C5
330p C6
330p C7
330p C8
BC547C Q2
BC251 Q3
820R R7
820R R8
13V VR2
13V VR3
TP31
TP32
100n C26
100n C27
100n C28
100n C29
47p C34
47p C35
CHOKE L1
CHOKE L2
CHOKE L3
6u8 C9
100n C10
6u8 C11
100n C12
TP25
TP26
TP27
GND1
GND2
68n C33
22K R14
10K R12
1K2 R13
22R R15
22R R16
T1
J1
RTS-232
CTS-232
DSR-232
DTR-232
TXD-232
RXD-422/485
RXDB-422/485
TXDB-422
TXDA-422
RXD-232
MUTE
GND
LINE OUT
LINE OUT
PREP: NAS
CHKD: CSA
APVD: N/A
CM: JG
DOCUMENT NO: 490598
REV: C
SHEET NO: 2

CHANGE ORDER/REVISION			
CO: 13586 REV: E AUT: CM:	CO: 9796 REV: F AUT: CM: JG	CO: 17158 REV: G AUT: CM:	CO: 17307 REV: G1 AUT: CM:

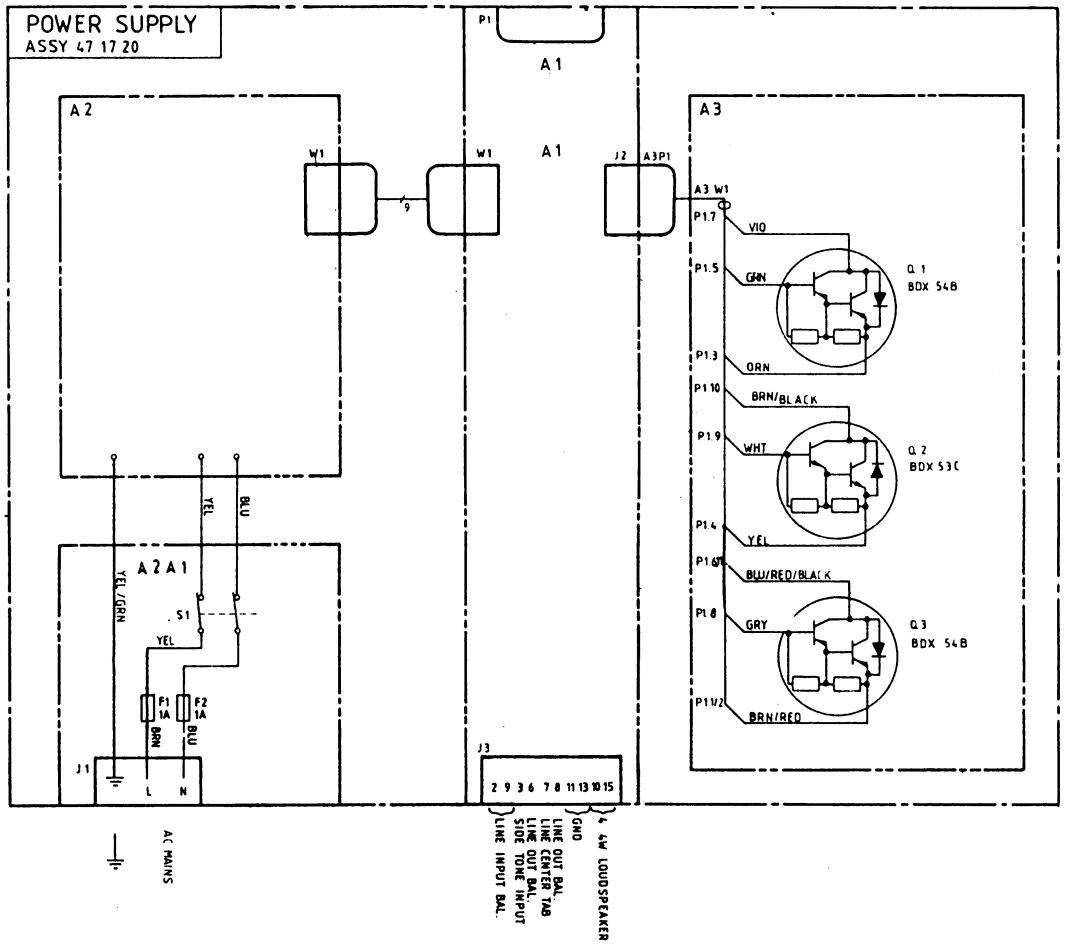


MATERIAL:	GENERAL TOLERANCE:	PROJECTION:	TERMA Elektronik AS P.O.Box 60667 HOVMARKEN 4, DK-8520 LYSTRUP, DENMARK
REVISION STATUS OF SHEETS (OTHER THAN G):			
SHEET NO.:			TITLE: COMPONENT LOCATION INTERFACE RS232/422/485
REVISION:			
CODE: D2	1 SHEET(S)	INITIAL RELEASE: 890807	DATE OF LATEST REV.: 94.08.19 / REV.: G1
PREP: IN	CHKD: CSA	APVD: N/A	CM: JG
			DOCUMENT NO.: 490598 PD / SHEET NO.: 1

ASSY 471720, 471534, 471550, POWER SUPPLY ASSEMBLY

Service Sheet A10A1 and A10A2

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075		Dansk Radio AS
			DR. FP 8-11-83	TITLE POWER SUPPLY
		ANGLES	CH.	
		LIN. DIM.	AP.	
47 19 09	RC4000		AP.	
47 17 12	RX4000	MATERIAL	FIRST ANGLE PROJECTION	SIZE A2 / CODE IDENT / DRAWING NO. 47 17 20
NEXT ASSY	USED ON			SCALE / SHEET 1 OF 1
APPLICATION				

Service Sheet A10

1. VEE Supply Filter

2. -15V Reference Voltage Regulator
The reference voltage is adjusted to -15, 3V at 25°C by means of R2.

3. Standby/ON Switch Circuit
When P1-A3 is grounded, Q1 is switched on supplying +15V to 4.

4. U2
Forms part of the PWRLO detector. R6 and R7 generate a reference ripple from the unregulated 8V.
The reference ripple is compared with a threshold level (R8, R9), holding Q2 in the off-state when the reference ripple exceeds the threshold level. Q3 and Q4 ensure a PWRLO signal during start-up until VBB reaches VEE.

5. VBB Regulator (+15V)
U4 compares VBB/3 with the 5V reference voltage and supplies the regulating current for the driving transistor Q6.

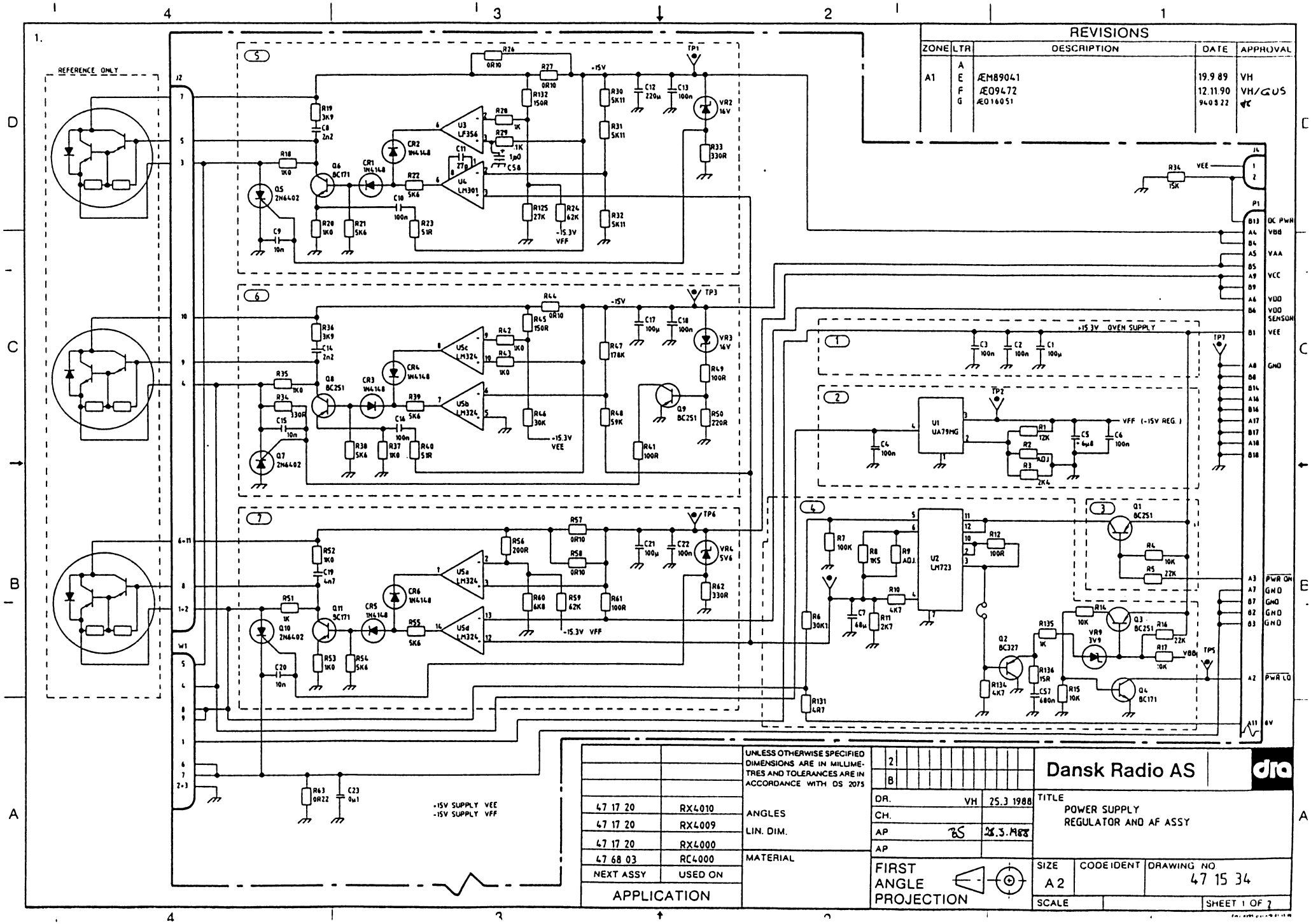
U3 forms the current limiting circuit. When the R26-27 voltage drop exceeds the R132 voltage drop, U3 shunts the regulating current for Q6 tracking a fold-back characteristic.
Q5, VR2 and R33 form a crow-bar protection on the regulator output voltage. The trigger point for Q5 is approx. +17V.

6. VAA Regulator (-15V)
U5B compares VAA with three times the 5V reference voltage and supplies the regulating current for the driving transistor Q8.

U4B forms the current limiting circuit similar in operation to 5. Q7, VR3, R49, R50 and Q9 form a crow-bar protection on the regulator output voltage. The trigger point for Q7 is approx.-17V.

7. VCC/VDD Regulator (+5V)
U5d compares VDD from a motherboard sense point (P1-B6) or through R61, with the 5V reference voltage and supplies the regulating current for the driving transistor Q11.

U5a forms the current limiting circuit similar in operation to 5. Q10, VR4 and R62 form a crow-bar protection on the regulated output voltage. The trigger point for Q10 is approx. +6.2V.



Service Sheet A10A1

8. AFDET and Line Input

The appropriate input is selected with S1. U6d makes it possible to drive the AFDET line with the 600 ohm line input.

9. Notch Filter

U7a, U7b and U7c 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 R83 to 1 kHz notch tune when TP9 is set to -11.5V.

10. Notch Control

R88, R89 and C35 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.

U7d forms a summing amplifier for AFDET, bandpass filter output and "Side-Tone" input.

11. AF-Gain Control

The AF signal from (9) is routed to U8-11. The control voltage between U8-6 and U8-9 adjusts the AF signal level at R106 by means of the emitter coupled amplifier within U8. 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.

12. Line Output Amplifier

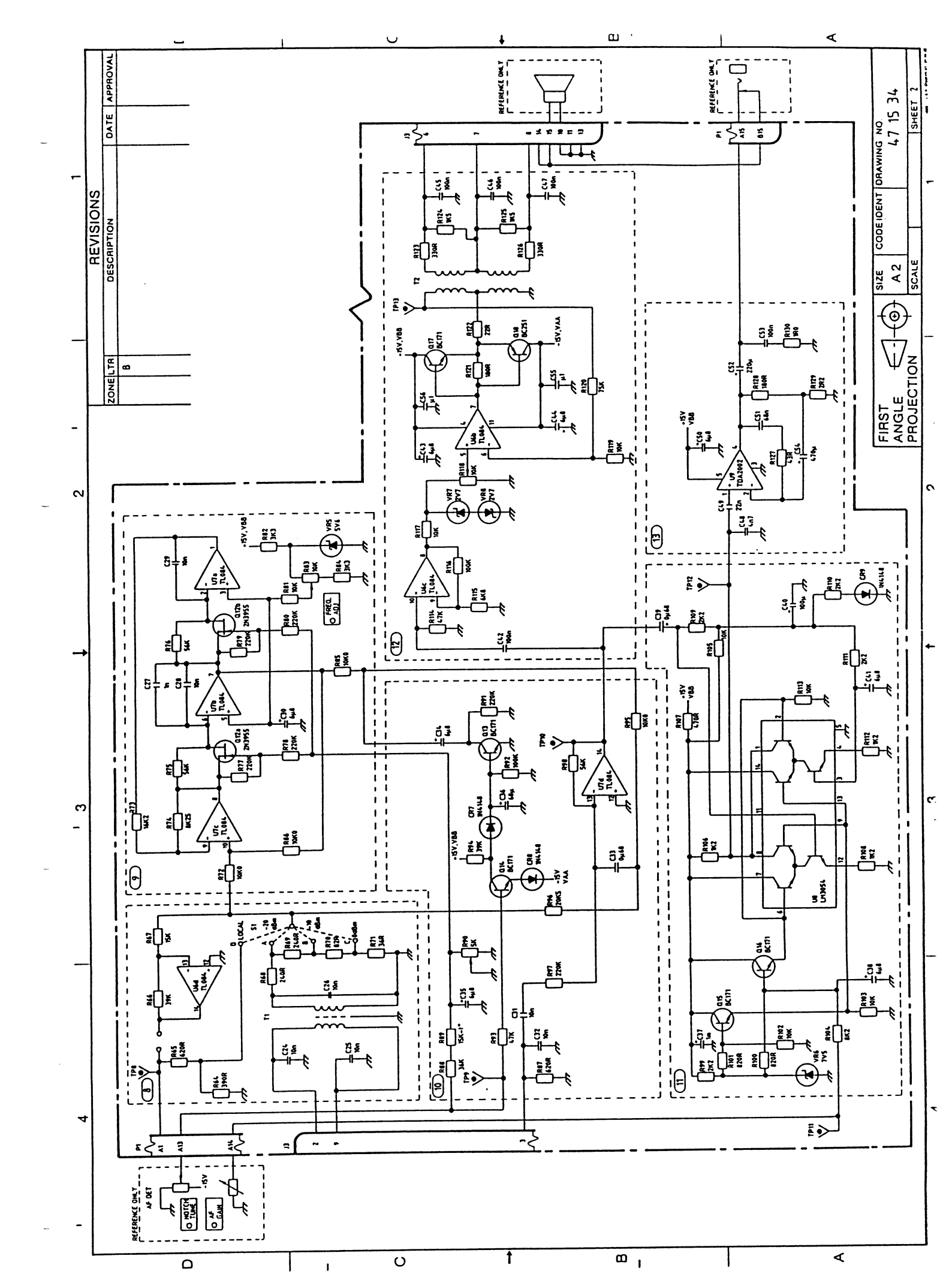
U6c, VR7 and VR8 form an amplifier with the output limited to +/- 3.5V peak.

U6b, Q17 and Q18 drive the transformer T2 and the feedback loop includes the transformer.

R123 and R126 give the 600 ohm output impedance independent of the transformer.

13. AF Output Amplifier

U9 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.



Service Sheet A10A1

1. ESD BESKYTTELSE PER (1990)

CAUTION
DEVICES ARE SUBJECT TO DAMAGE BY STATIC ELECTRICITY

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
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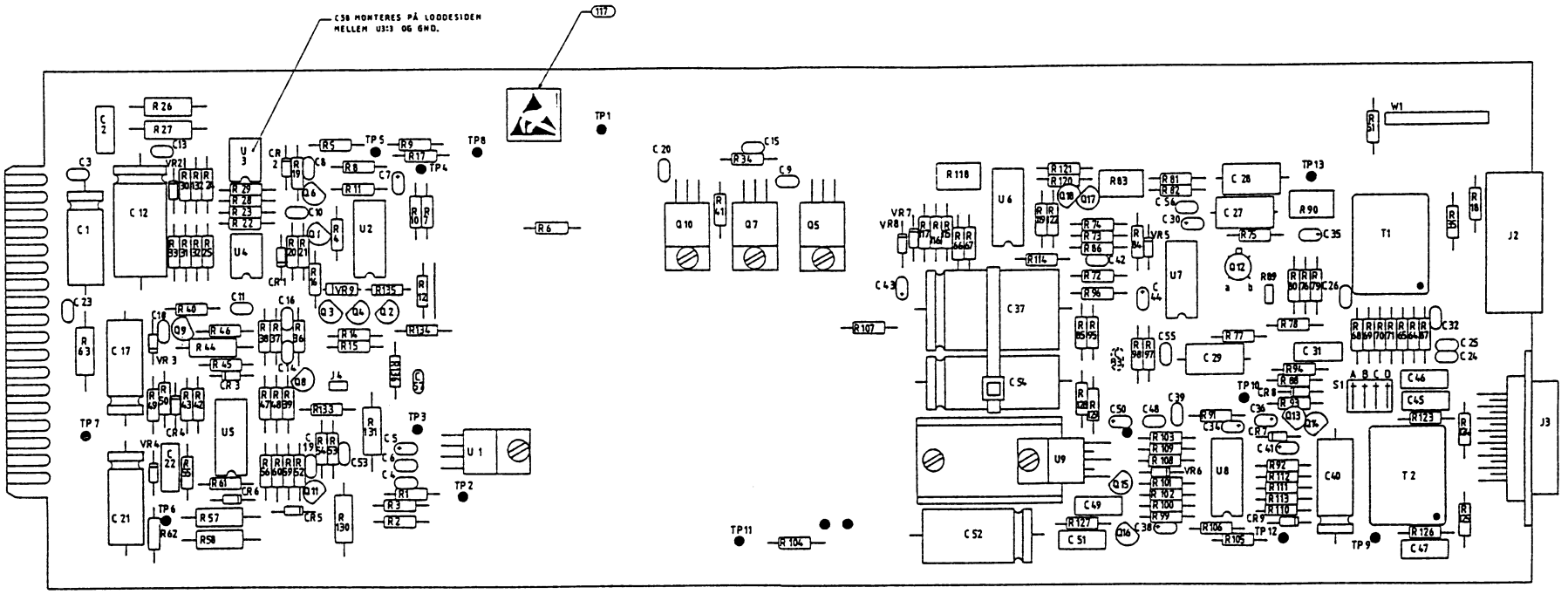
	H	Æ09472	12.11.90	VH/CUS
	J	Æ016051	940823	dc



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075		Dansk Radio AS
			DR. Slam 940627	TITLE: Regulator and AF assy
		ANGLES	CH.	
		LIN. DIM.	AP.	
471909	RC 4000		AP	
471712	RX 4 000	MATERIAL	FIRST ANGLE PROJECTION	SIZE A1 / CODE IDENT / DRAWING NO. 47 15 34
NEXT ASSY	USED ON			SCALE / SHEET 1 OF 1
APPLICATION				

Service Sheet A10A1

1. EMI Filter for AC Mains Supply

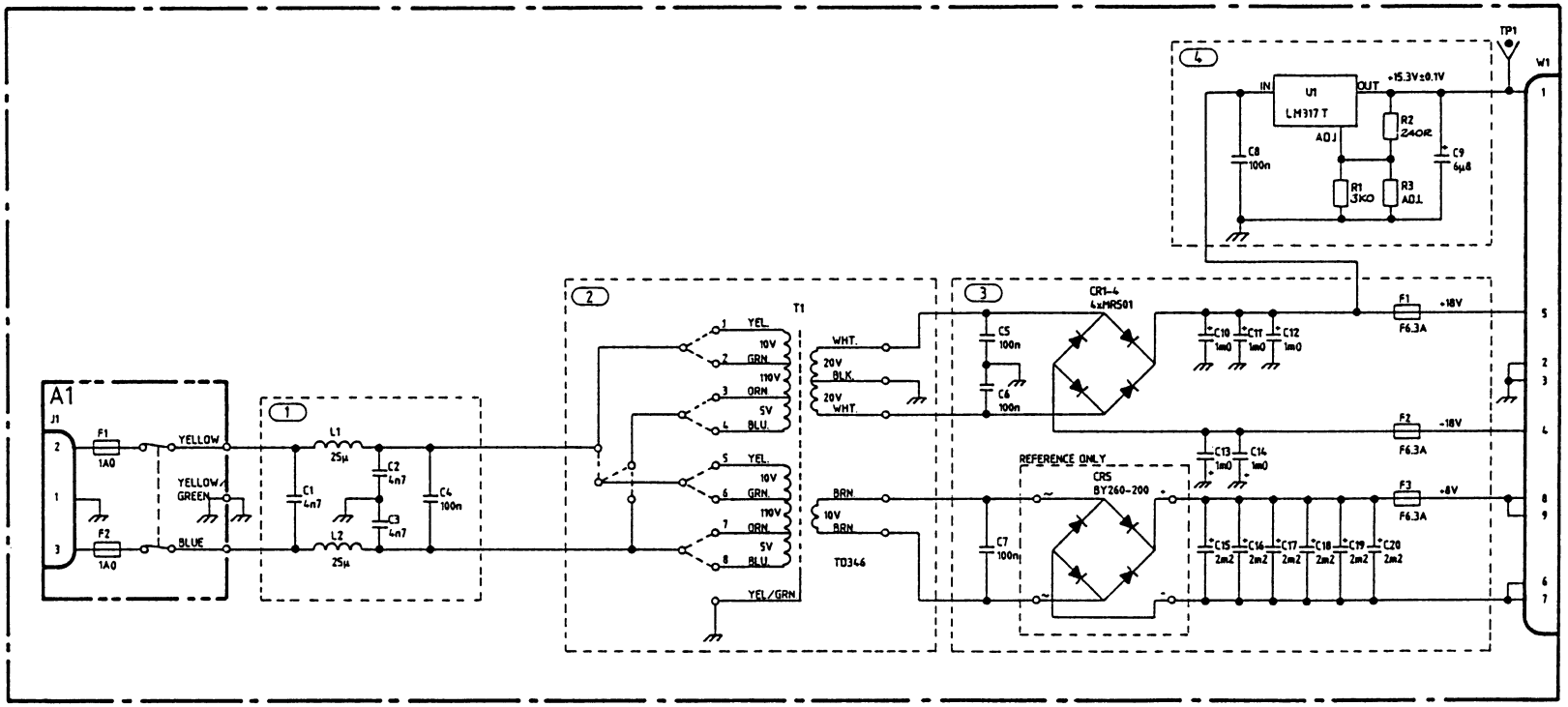
2. Mains Transformer
with 110V to 125V and 220V to 250V in 5V steps.

3. Rectifiers and Filters

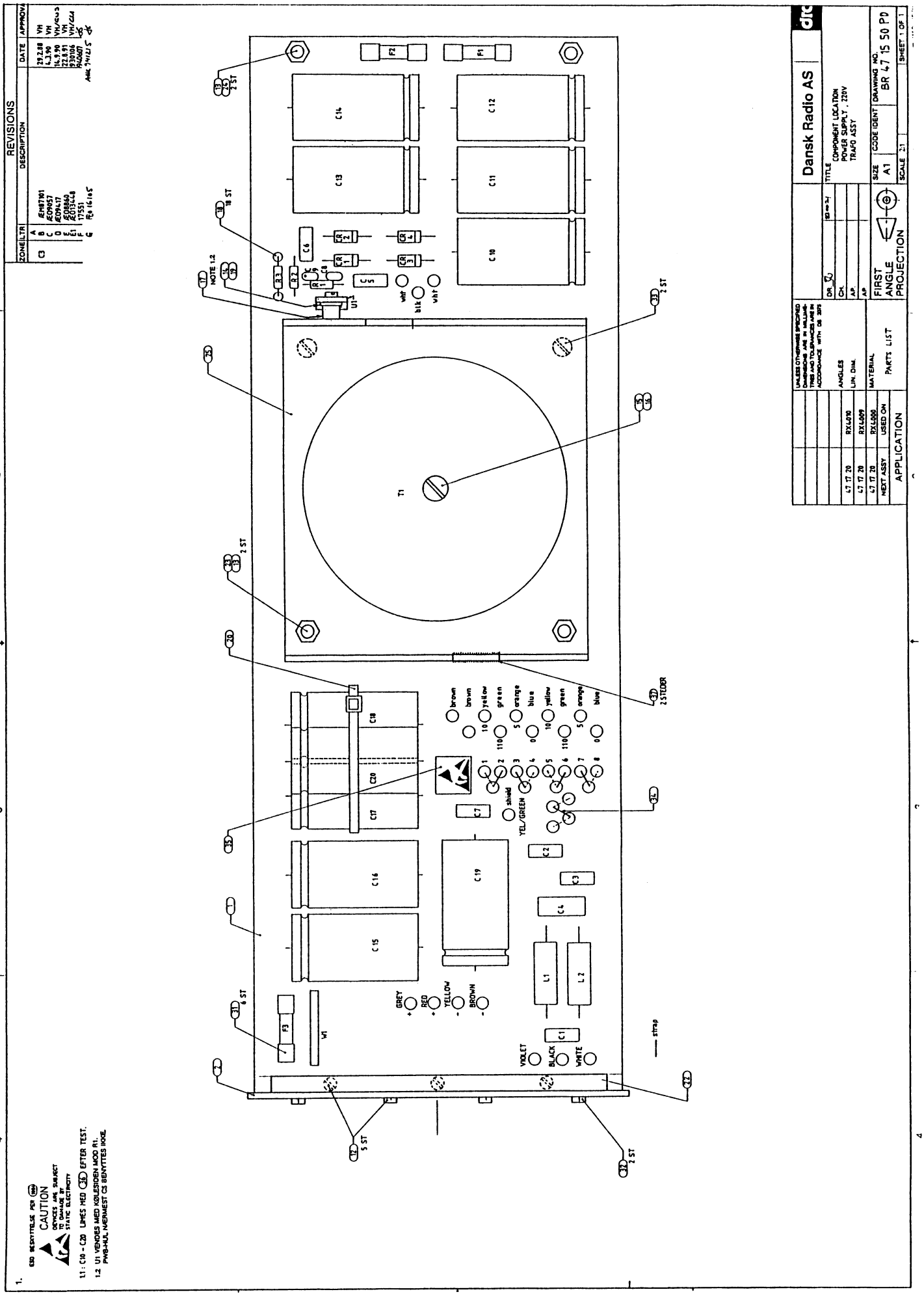
4. +15V Regulator for Standby Supply
By means of R3 the voltage is adjusted to +15.3V at 25°C.

Service Sheet A10A2

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	A			
	B	Æ09057	4.3.90	VH
	C	Æ0 16105	ANK 941216	
	C1	Æ0 22051	TGP 930117	



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075		Dansk Radio AS
			DR. VH 21.3 1988	TITLE POWER SUPPLY , 220V TRAFO ASSY
		ANGLES	CH.	
471720	RX4010	LIN. DIM.	AP. 21.3.88	
471720	RX4009		AP.	
471720	RX4000	MATERIAL	FIRST ANGLE PROJECTION	SIZE A2 / CODE IDENT / DRAWING NO. BR 47 15 50 EC
NEXT ASSY	USED ON			SCALE / SHEET 1 OF 1
APPLICATION				



Service Sheet A10A2

ASSY 600135, FRONT PANEL CIRCUIT
ASSY 489883, DISPLAY BOARD ASSEMBLY
ASSY 600133, MODE KEY BOARD ASSEMBLY
ASSY 600131, NUM. KEYBOARD ASSEMBLY

Service Sheet A11A1, A11A1A1,
A11A1A2 AND A11A1A3

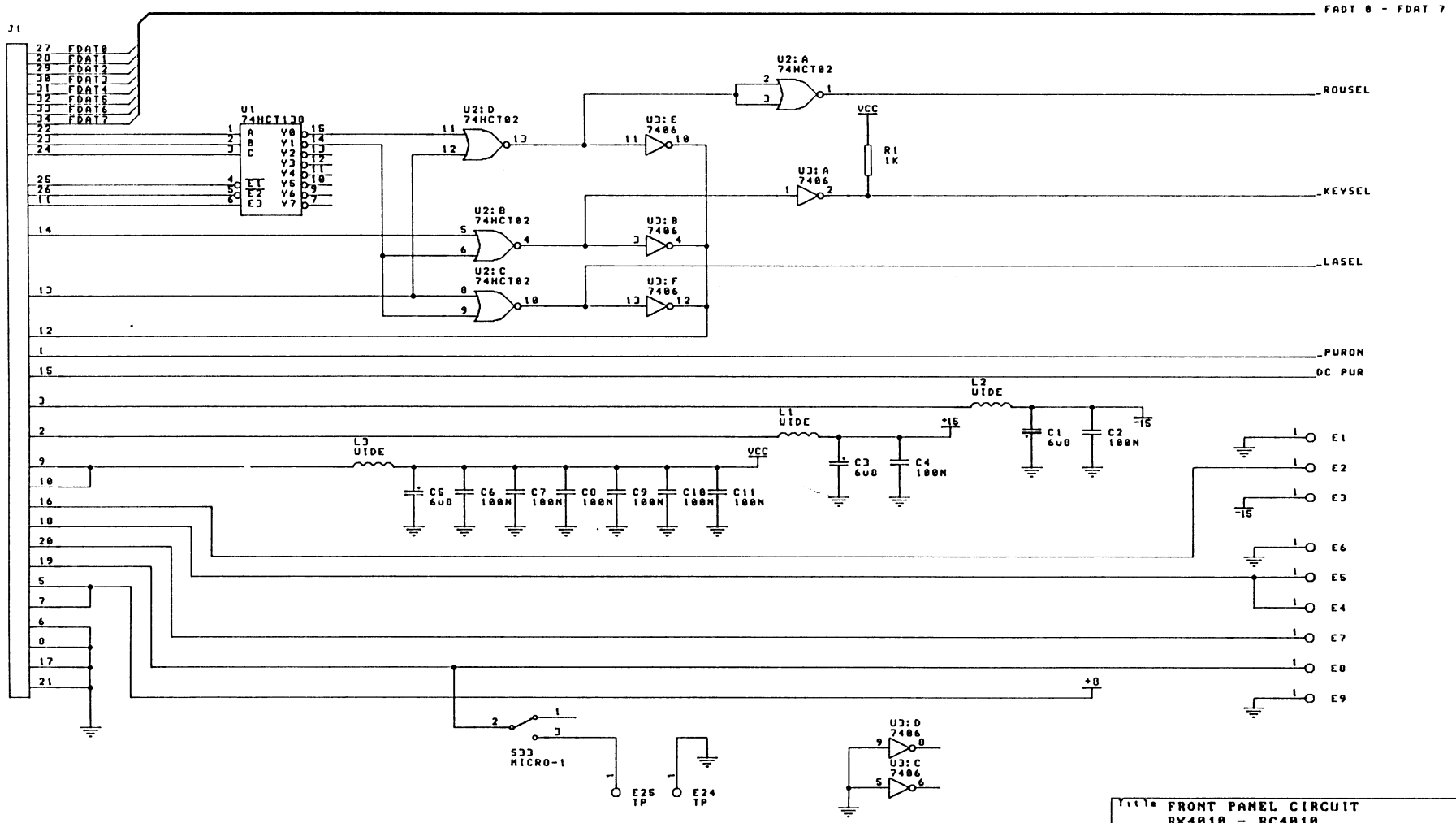
Assy 600135, Front Panel Circuit **Schematic 1**

1. Address Decoding

With associated gates for generation of acknowledge FACK, as handshaking signal for the microcomputer.

2. Supply Filters

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL

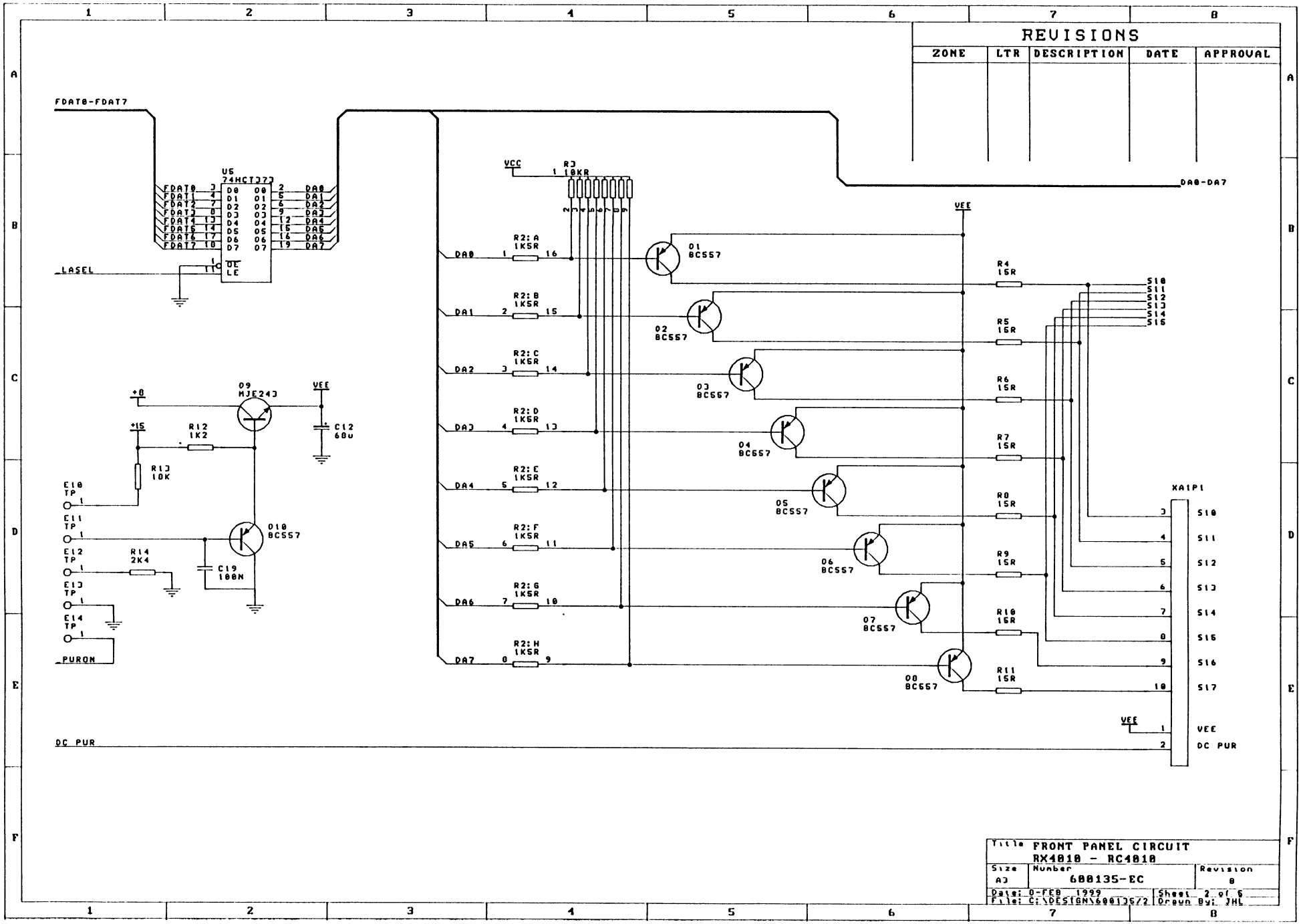


Title	FRONT PANEL CIRCUIT RX4010 - RC4010	
Size A3	Number 600135-EC	Revision B
Date: 8-FEB 1999		Sheet 1 of 6
File: C:\DESIGN\600135\1		Drawn By: JHL

3. Eight-bit Latch
Used for segment information to the displays and LEDs, and data to D/A-converter (11).

4. Q1-Q8
Drivers for Segment Information. R4-R11: Current limiting resistors.

6. Dimmer Circuit
Q9 controls the light in displays, LEDs and S-meter.


REVISIONS
ZONE
LTR
DESCRIPTION
DATE
APPROVAL
FDAT0-FDAT7
U5
74HCT377
LASEL
VCC
R3
10KR
DA0-DA7
VEE
R2:A 1K5R
R2:B 1K5R
R2:C 1K5R
R2:D 1K5R
R2:E 1K5R
R2:F 1K5R
R2:G 1K5R
R2:H 1K5R
Q1 BC557
Q2 BC557
Q3 BC557
Q4 BC557
Q5 BC557
Q6 BC557
Q7 BC557
Q8 BC557
R4 15R
R5 15R
R6 15R
R7 15R
R8 15R
R9 15R
R10 15R
R11 15R
S10
S11
S12
S13
S14
S15
S16
S17
XA1P1
VEE
DC PUR
+8
+15
Q9 MJE243
C12 680u
R12 1K2
R13 10K
E10 TP
E11 TP
E12 TP
E13 TP
E14 TP
Q10 BC557
R14 2K4
C19 100N
PURON
Title FRONT PANEL CIRCUIT
RX4010 - RC4010
Size A3
Number 600135-EC
Revision B
Date: 8-FEB 1999
Sheet 2 of 6
File: C:\DESIGN\600135C2
Drawn By: JHL

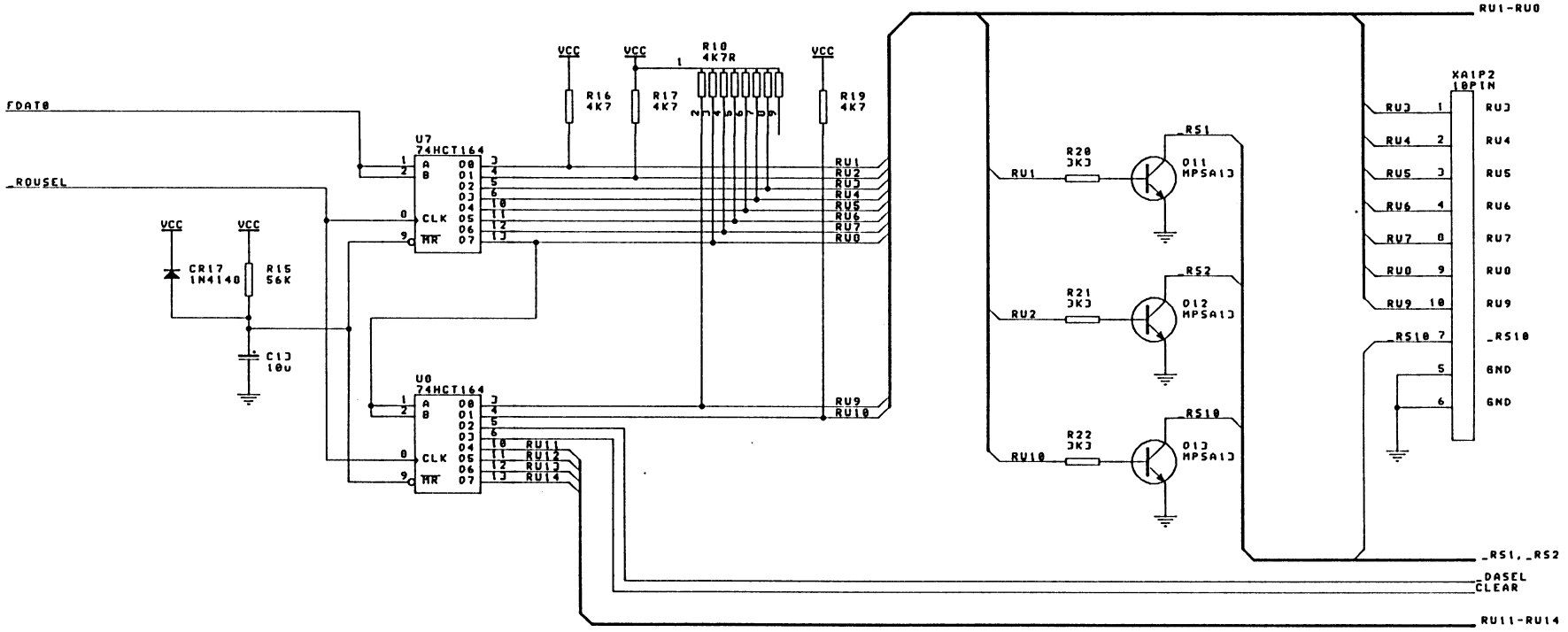
7. U7, U8

Shift registers with associated pull-up network, used for multiplexing displays, LEDs and switches. It also selects the sample hold circuit (13), and clears tune-F/F (12). R15, C13 clear U7-U8 during start-up.

8. Drivers

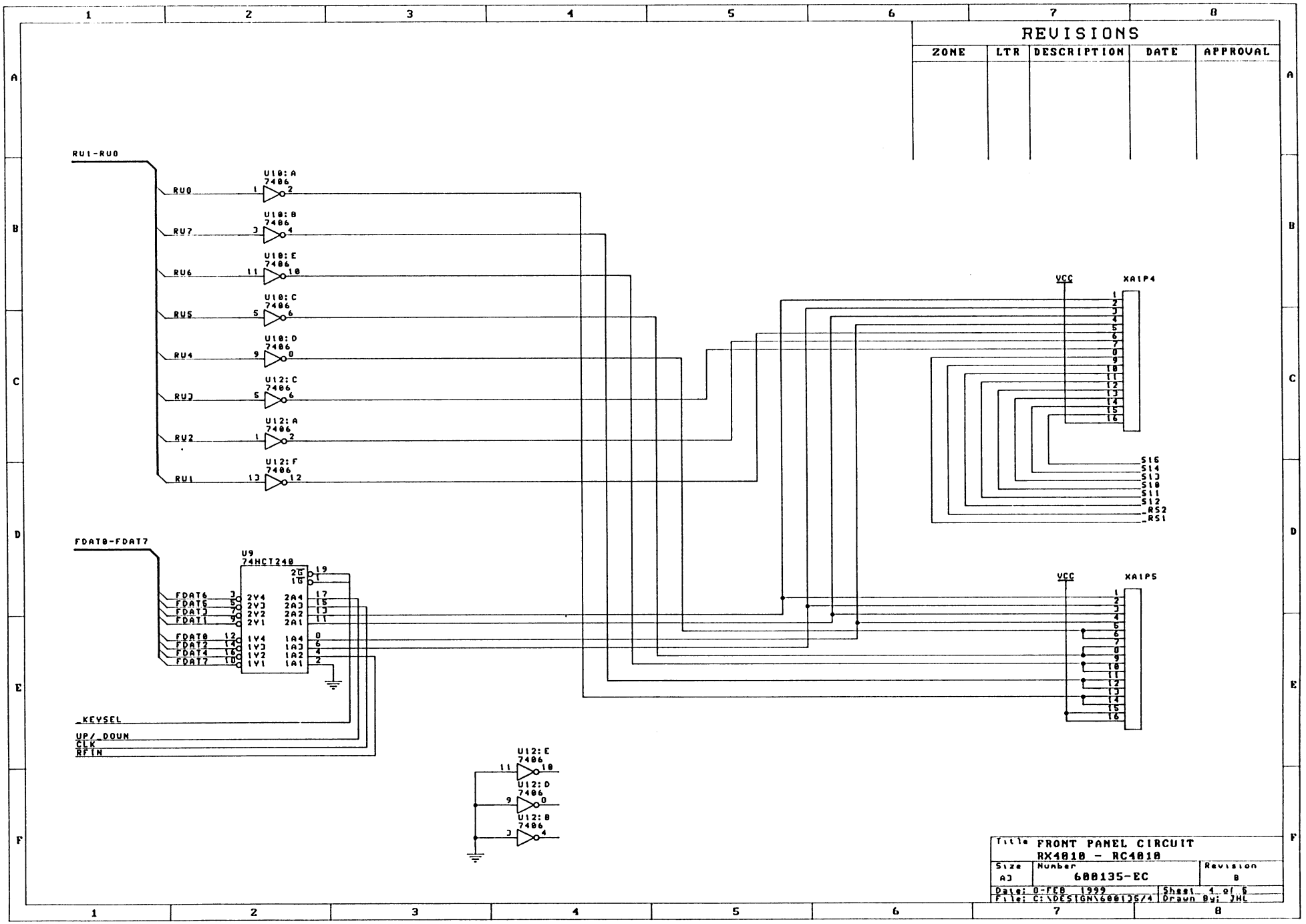
for multiplexing of LEDs.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL



Title: FRONT PANEL CIRCUIT RX4010 - RC4010		
Size: A3	Number: 600135-EC	Revision: B
Date: 8-FEB-1999		Sheet 3 of 5
File: C:\DESIGN\600135\3	Drawn By: JP	

9. Eight-bit Output Buffer
read by the microcomputer.


REVISIONS
ZONE
LTR
DESCRIPTION
DATE
APPROVAL
RU1-RU0
U10:A 7406
U10:B 7406
U10:E 7406
U10:C 7406
U10:D 7406
U12:C 7406
U12:A 7406
U12:F 7406
RU0
RU7
RU6
RU5
RU4
RU3
RU2
RU1
VCC
XA1P4
SL6
SL4
SL3
SL0
SL1
SL2
RS2
RS1
FDAT0-FDAT7
U9
74HCT240
FDAT6
FDAT5
FDAT3
FDAT1
FDAT0
FDAT2
FDAT4
FDAT7
XA1P5
_KEYSEL
UP/_DOWN
CLK
RFIN
U12:E 7406
U12:D 7406
U12:B 7406
Title FRONT PANEL CIRCUIT
RX4010 - RC4010
Size A3
Number 600135-EC
Revision B
Date: 0-FEB 1999
Sheet 4 of 6
File: C:\DESIGN\600135\4
Drawn By: JHL

11. Eight-bit Digital to Analogue Converter

R24: Pull-up network
R25-R33: R-2R network
U6A: Operational Amplifier with an output range from 5V to 10V.

12. Circuit for reading of TUNE Control

U11A: is set when tuning.
U11B: is set when tuning up.
When U11 has been read by the microcomputer, it will clear U11A.

13. Sample and Hold Circuit

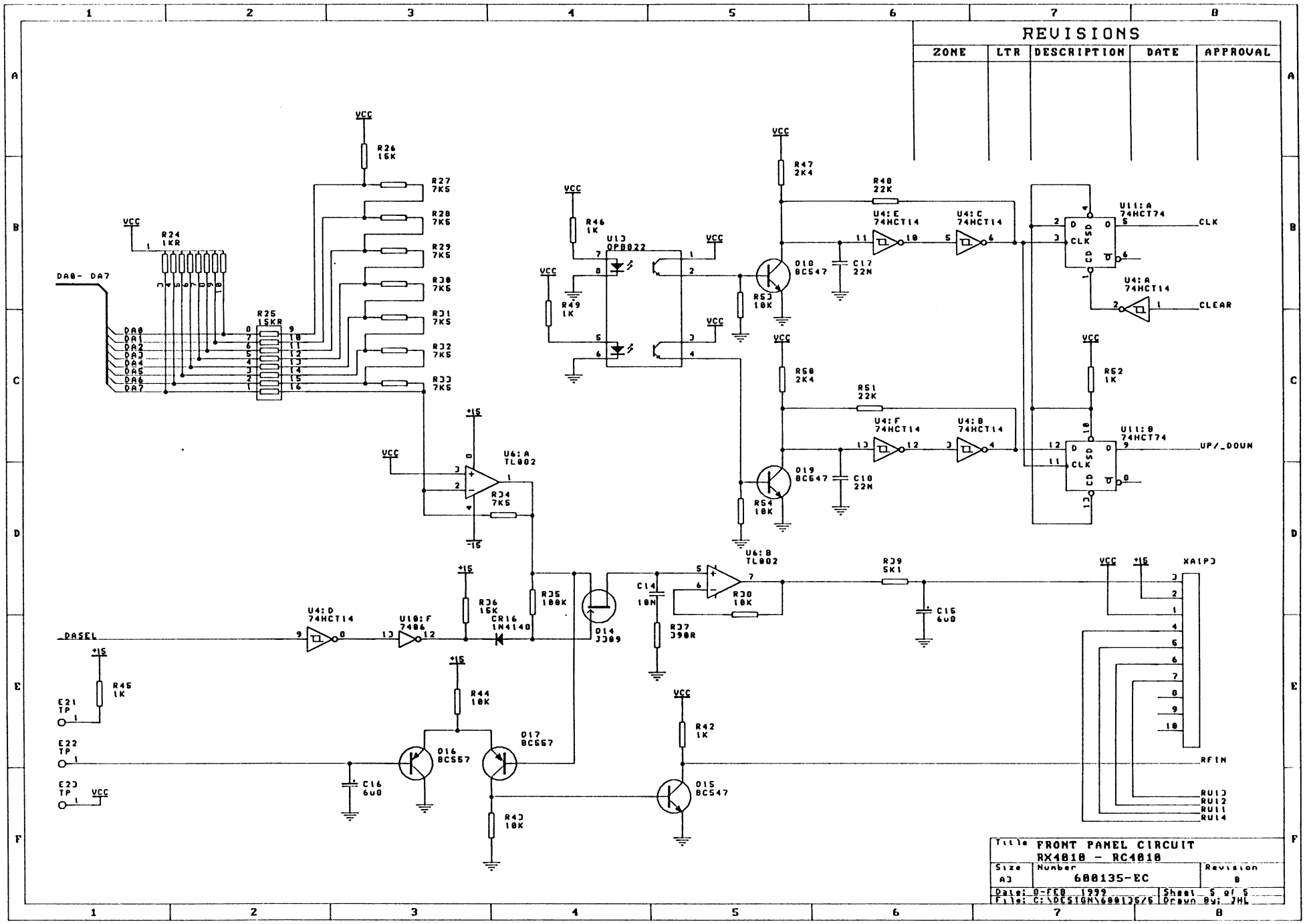
The circuit around Q14 and U6B performs a sample and hold circuit. It is used as a source generator to the S-meter and for A/D conversion (15).

14. Low pass Filter

R39, C15 is the low pass filter for the meter voltage.

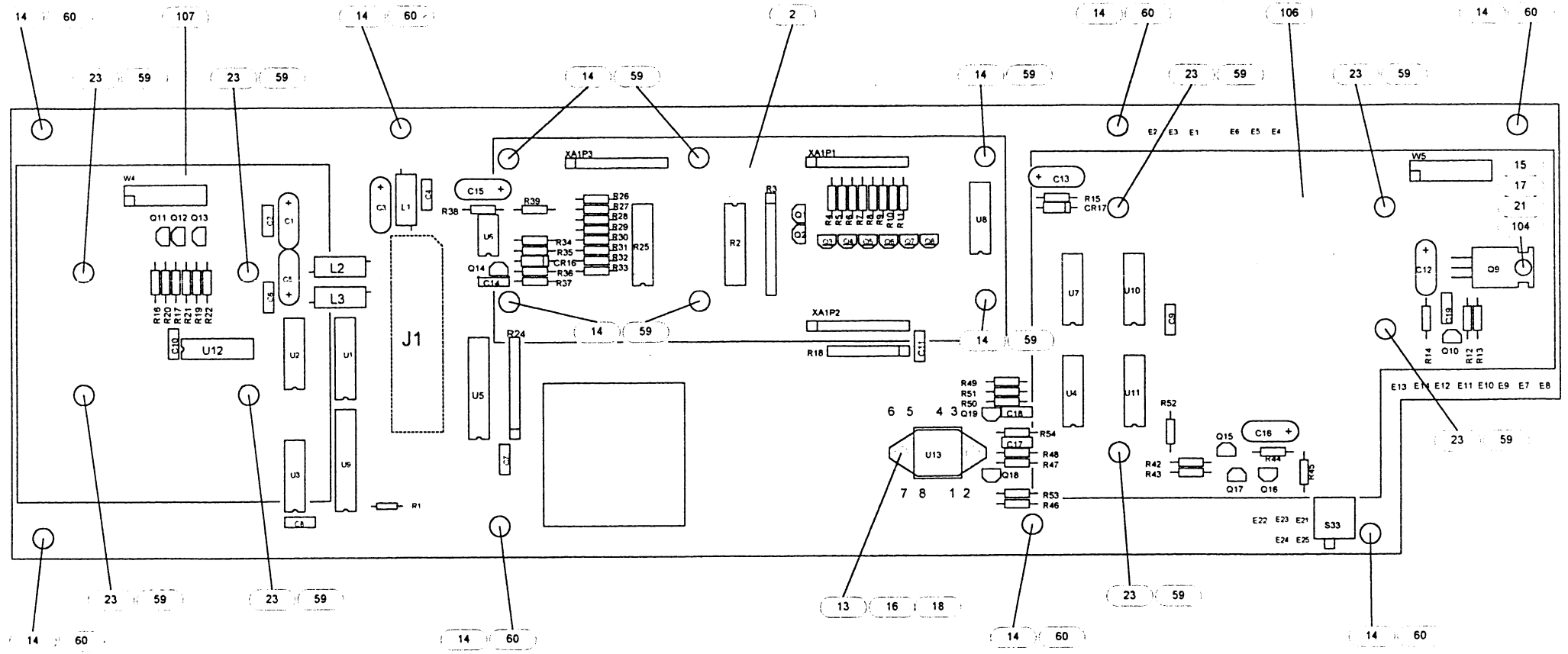
15. Voltage Comparator

By means of the D/A-converter (11) and the comparator circuit (Q15 - Q17) an A/D-conversion is performed.


REVISIONS
ZONE
LTR
DESCRIPTION
DATE
APPROVAL
VCC
R26 15K
R27 7K5
R28 7K5
R29 7K5
R30 7K5
R31 7K5
R32 7K5
R33 7K5
R24 1KR
R25 15KR
DA0- DA7
DA0
DA1
DA2
DA3
DA4
DA5
DA6
DA7
R46 1K
R49 1K
U13 OPB822
R47 2K4
R48 22K
U4:E 74HCT14
U4:C 74HCT14
Q10 BC547
C17 22N
R53 10K
U11:A 74HCT74
CLK
U4:A 74HCT14
CLEAR
R50 2K4
R51 22K
U4:F 74HCT14
U4:B 74HCT14
Q19 BC547
C10 22N
R54 10K
R52 1K
U11:B 74HCT74
UP/_DOWN
+15
-15
U6:A TL082
R34 7K5
U6:B TL082
R36 15K
R35 100K
CR16 1N4148
D14 J309
C14 10N
R37 390R
R30 10K
R39 5K1
C15 6u8
XA1P3
DASEL
U4:D 74HCT14
U10:F 7406
R45 1K
E21 TP
E22 TP
E23 TP
R44 10K
Q16 BC557
Q17 BC557
C16 6u8
R43 10K
R42 1K
Q15 BC547
RFIN
RU13
RU12
RU11
RU14
Title FRONT PANEL CIRCUIT
RX4010 - RC4010
Size A3
Number 600135-EC
Revision B
Date: 0-FEB 1999
File: C:\DESIGN\600135\5
Sheet 5 of 5
Drawn By: JHL

NOTES:
1. ALLE SKRUEHOVEDER MOD PRINT MONTERES MED FLADSKIVE FN. 20
2. DE 4 MIDTERBEN PÅ U13 MONTERES MED FN. 22, LÆNGDE 9MM.

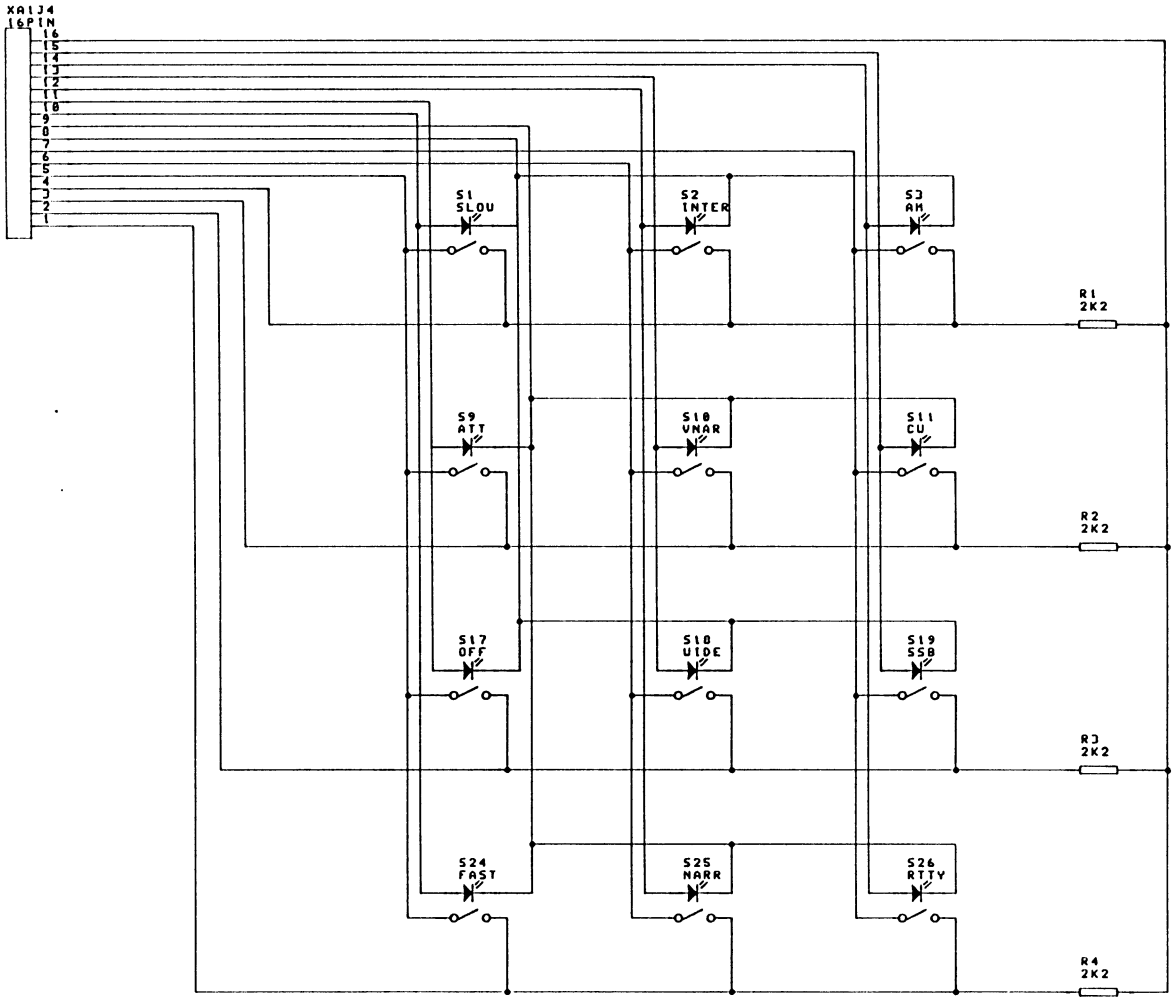
REVISIONS			
LTR	Description	DATE	APP.
	RELEASE	99.03.05	JHL



DANSK RADIO Comm. ApS

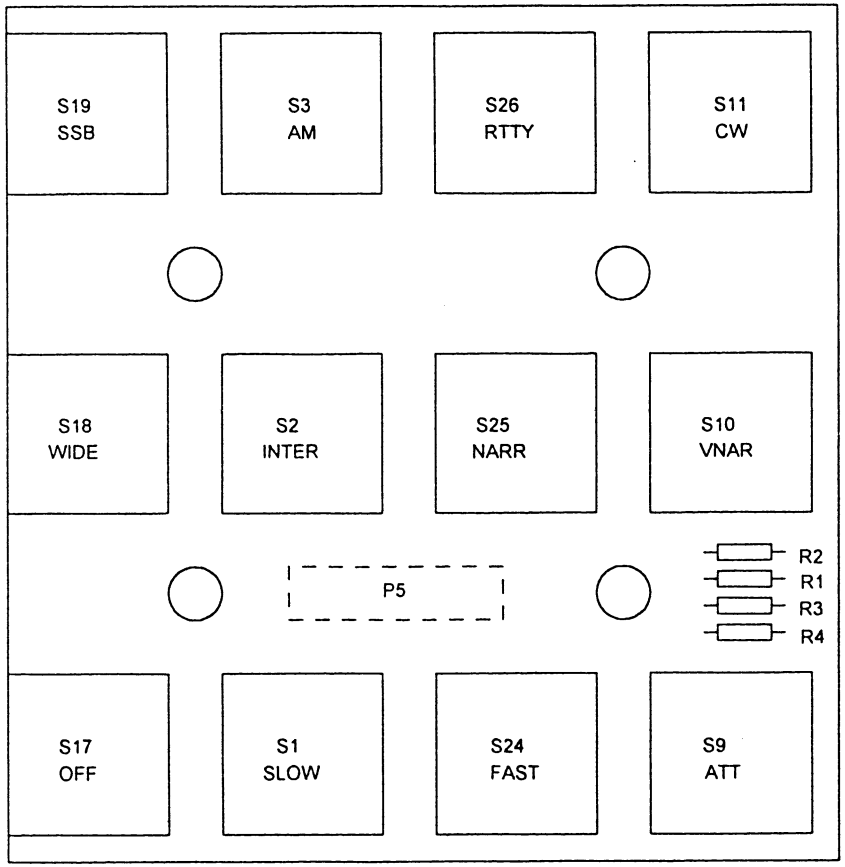
FIRST ANGLE PROJECTION		SIZE A 3	DRAWING NO: 600135 PD
		Sign. KL	SHEET: 1 of 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL



Title: MODE KEYBOARD RX4010 - RC4010		
Size: A3	Number: 600133-EC	Revision: A
Date: 27-JAN 1999 File: C:\DESIGN\600133\1	Sheet 1 of 1 Drawn By: JHL	

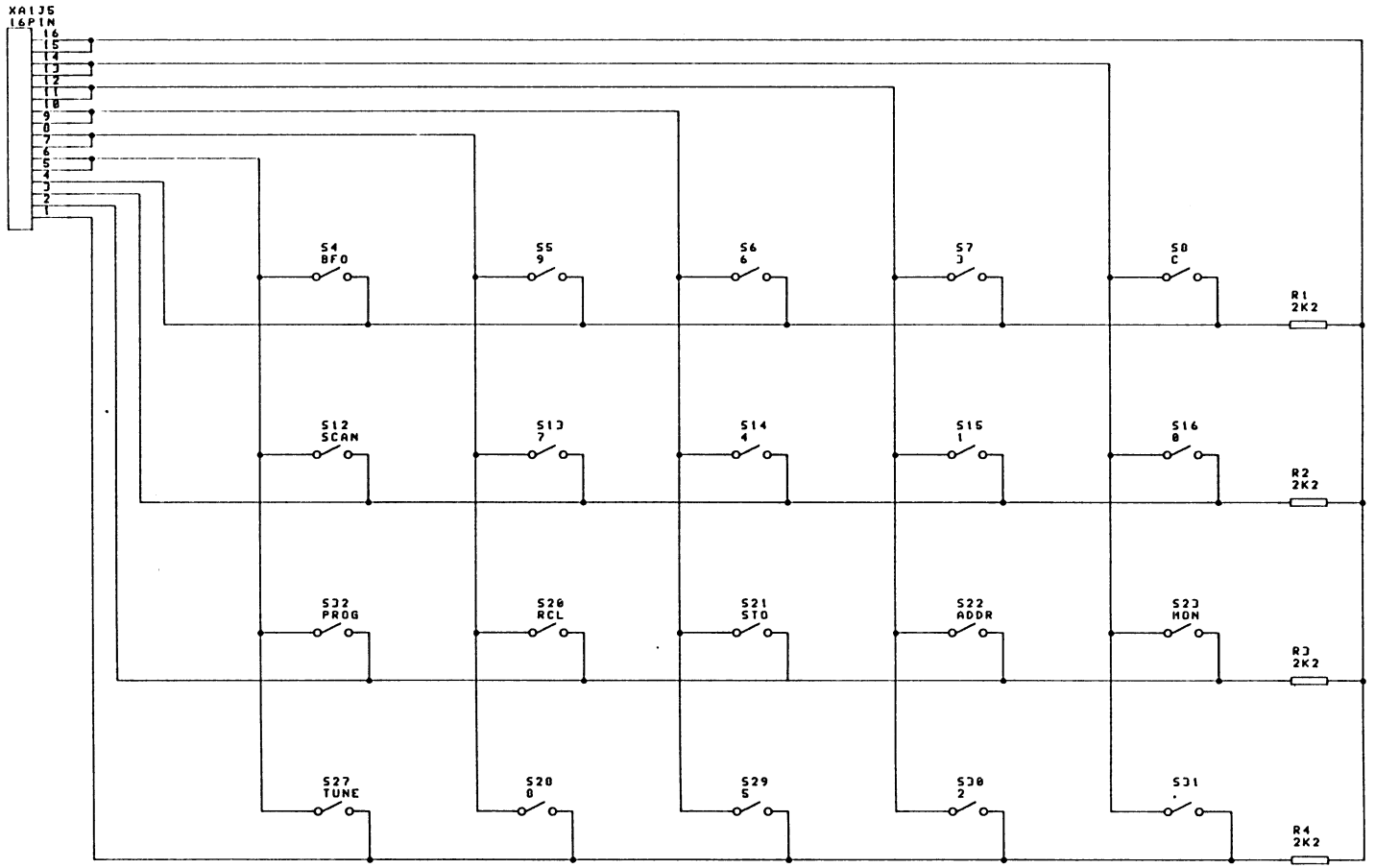
REVISIONS			
LTR	Description	DATE	APP.
	RELEASE	99.03-03	JHL



DANSK RADIO Comm. ApS

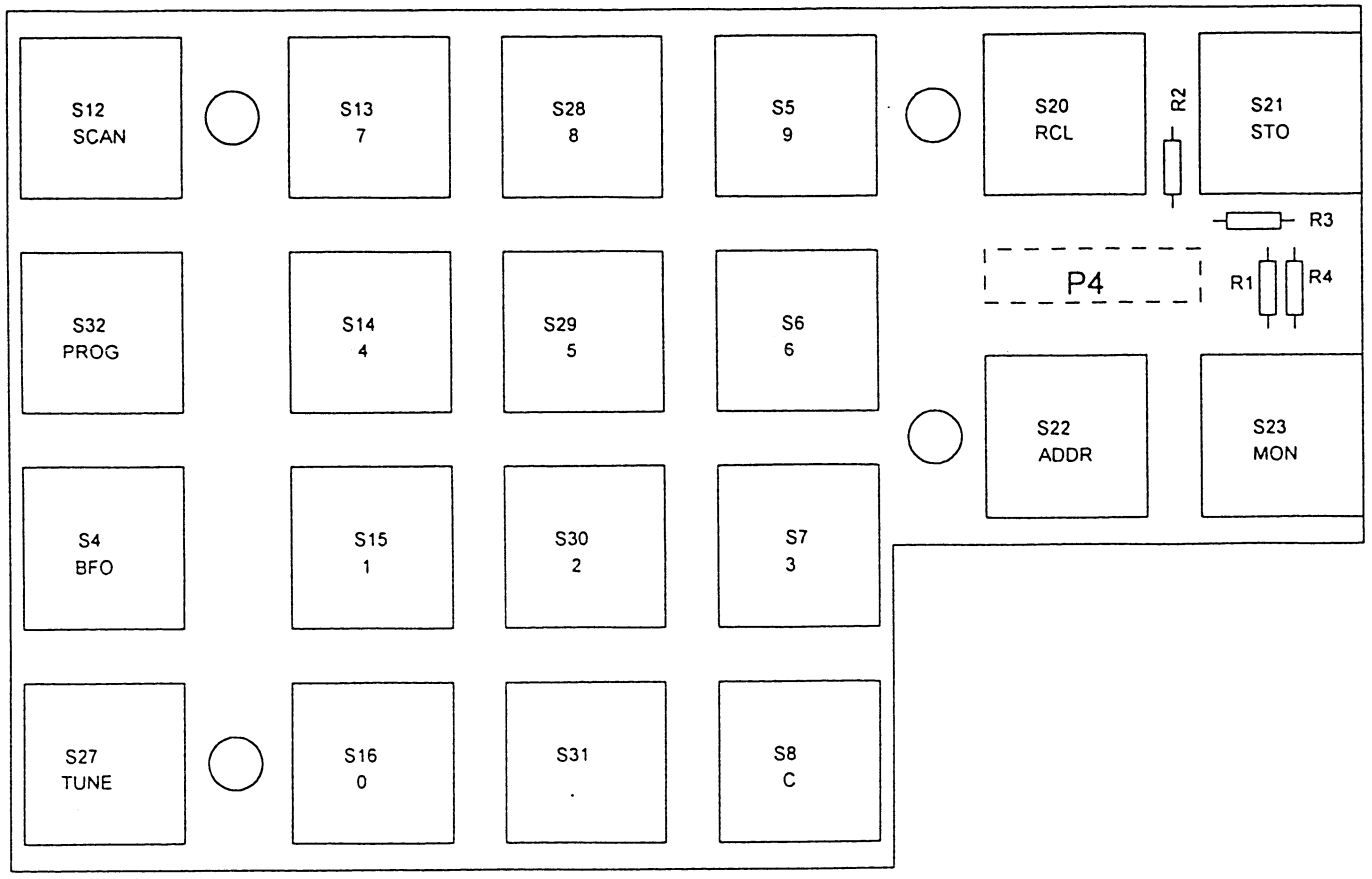
FIRST ANGLE PROJECTION	SIZE: A 3	DRAWING NO: 600133 PD
	Sign. KL	SHEET: 1 of 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL



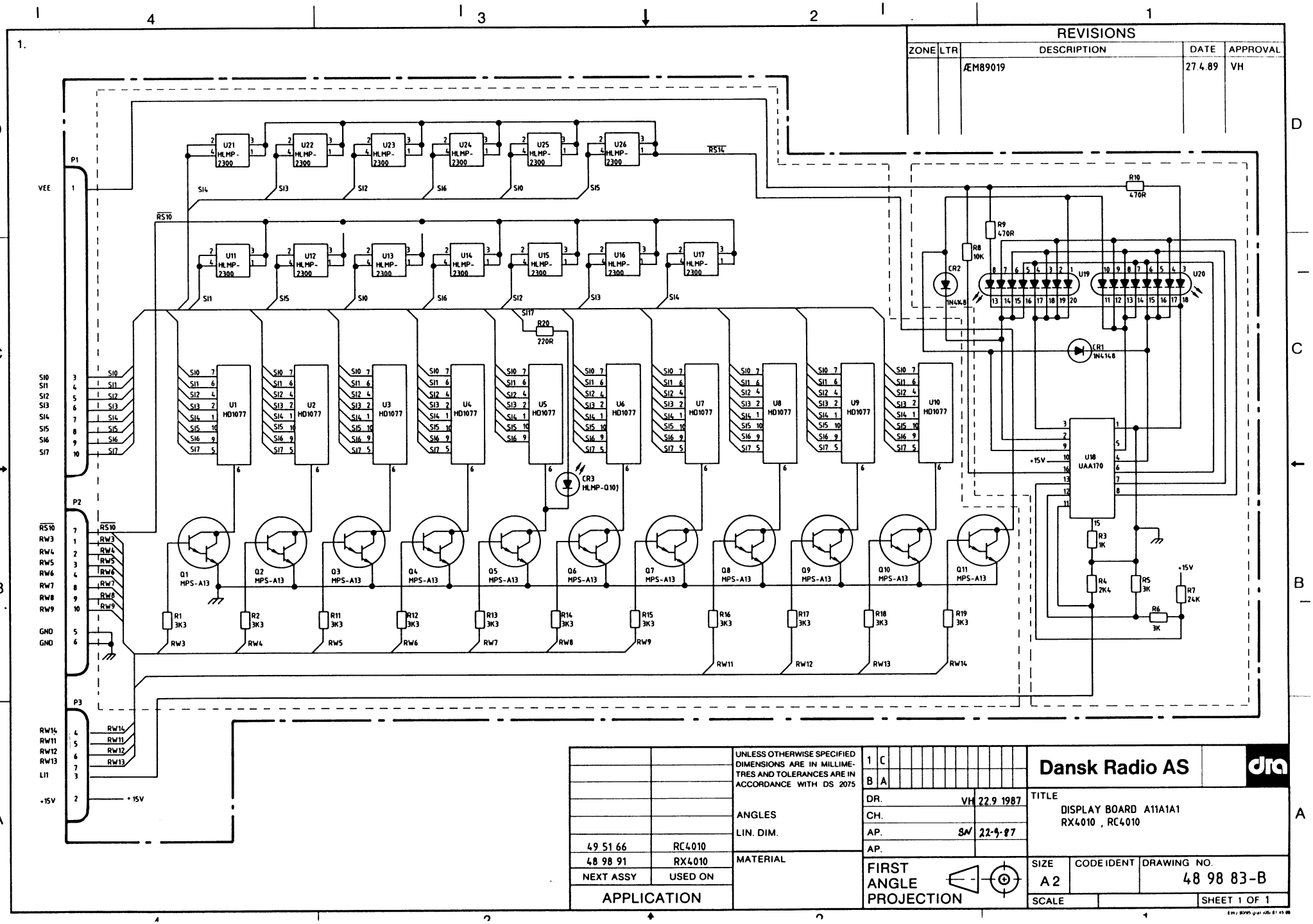
Title	KEYBOARD, NUMERICAL RC4810	
Size A3	Number 600131-EC	Revision A
Date: 8-FEB-1999		Sheet 1 of 1
File: C:\DESIGN\600131\1		Drawn By: JHL

REVISIONS			
LTR	Description	DATE	APP.
	RELEASE	99.03-03	JHL



DANSK RADIO Comm. ApS

FIRST ANGLE PROJECTION	SIZE: A 3	DRAWING NO: 600131 PD
	Sign. KL	SHEET: 1 of 1



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075

ANGLES

LIN. DIM.

MATERIAL

49 51 66	RC4010
48 98 91	RX4010
NEXT ASSY	USED ON

APPLICATION

DR.	VH 22.9 1987	
CH.		
AP.	SN 22-9-87	
AP.		

FIRST ANGLE PROJECTION

Dansk Radio AS

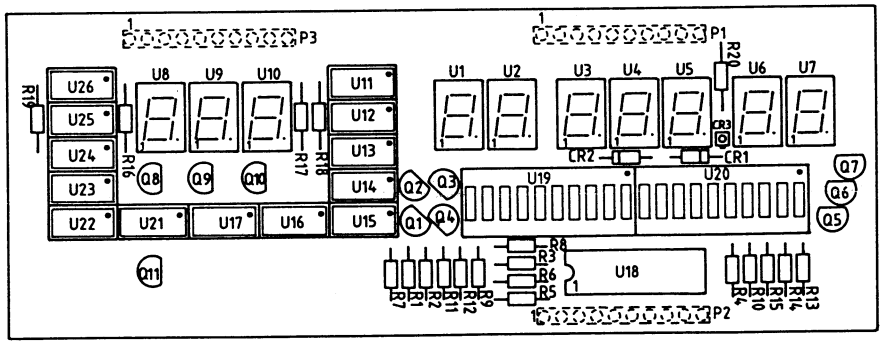
TITLE
DISPLAY BOARD A11A1A1
RX4010 , RC4010

SIZE	CODE IDENT	DRAWING NO.
A2		48 98 83-B
SCALE		SHEET 1 OF 1

Service Sheet A11A1A1

1. NOTE: U1-2-3-4-5-6-7 SKAL HAVE SAMME BOGSTAVKODE.
U8-9-10 SKAL HAVE SAMME BOGSTAVKODE.
U19-20 SKAL HAVE SAMME BOGSTAVKODE.
U11 TIL OG MED U26 SKAL HAVE SAMME BOGSTAVKODE.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	A			
	B	REVISED	22.3.88	VH
	C	ÆO8984	3.9.91	VH



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075		Dansk Radio AS
		ANGLES	DR. VH 22.9 1987	TITLE COMPONENT LOCATION DISPLAY BOARD RX4010
		LIN. DIM.	CH.	
			AP. EN 22-9-87	
			AP.	
489891	RX4010	MATERIAL	FIRST ANGLE PROJECTION	SIZE A2 / CODE IDENT / DRAWING NO. 48 98 83
NEXT ASSY	USED ON			SCALE 2:1 / SHEET 1 OF 1
APPLICATION				

Service Sheet A11A1A1

ASSY 471925, MOTHERBOARD ASSEMBLY

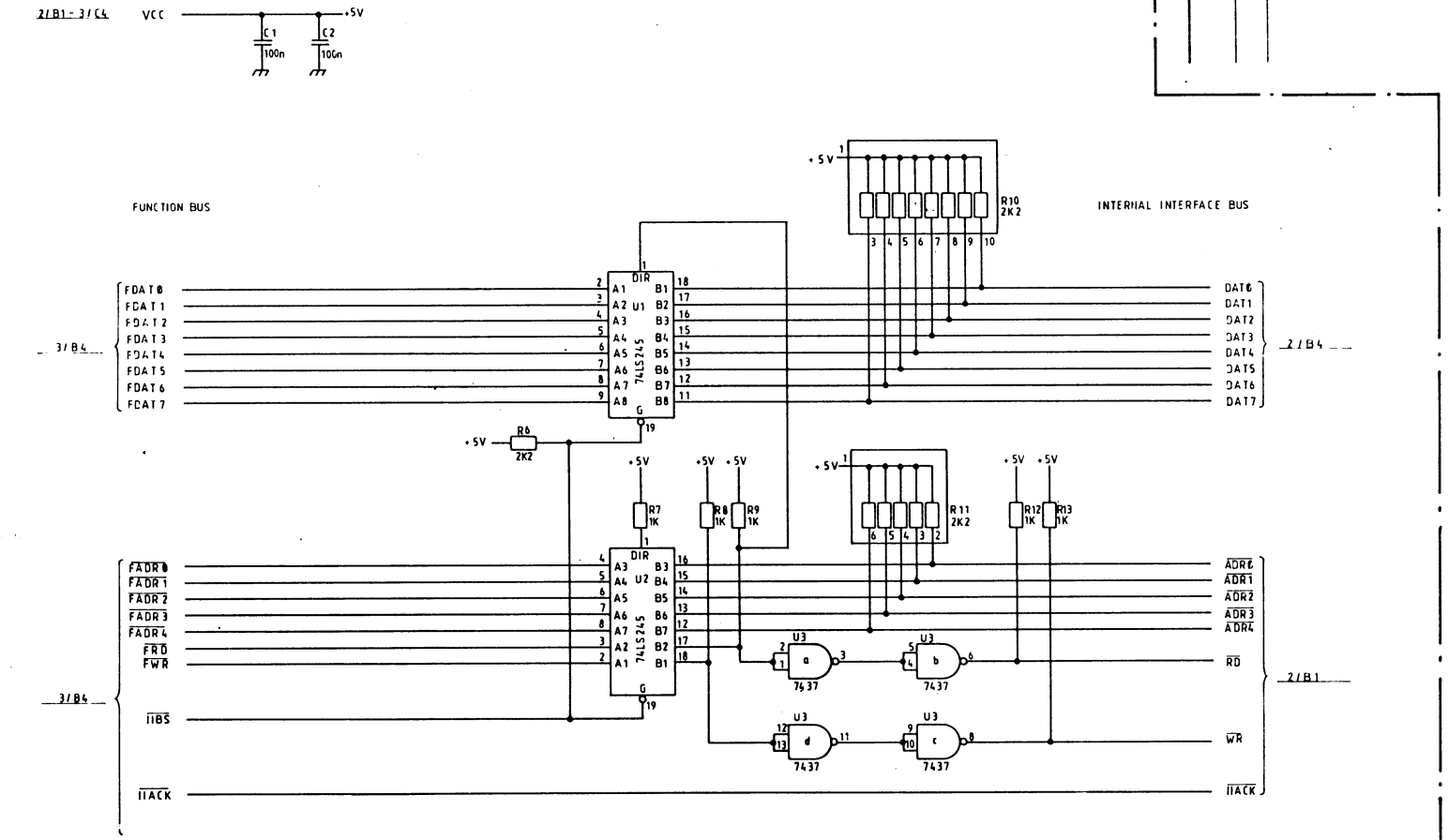
Service Sheet A12A1

Assy 471925, Motherboard Assembly

To avoid noise in the more sensitive parts of the receiver controller, two buffers U1 and U2 separate the internal interface bus from the function bus. The internal interface bus is only activated when necessary.

Service Sheet A12A1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPR
	A			
	B	ÆM88020	3.3.88	VH



476056	RC 4000		
NEXT ASSY	USED ON		
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES IN ACCORDANCE WITH DS 2075

ANGLES:

LIN. DIM.:

MATERIAL:

DR.: H.PRÆTORIUS	830412	
CH.: HP	13/4-83	
AP.:		
AP.:		

FIRST ANGLE PROJECTION

Dansk Radio AS

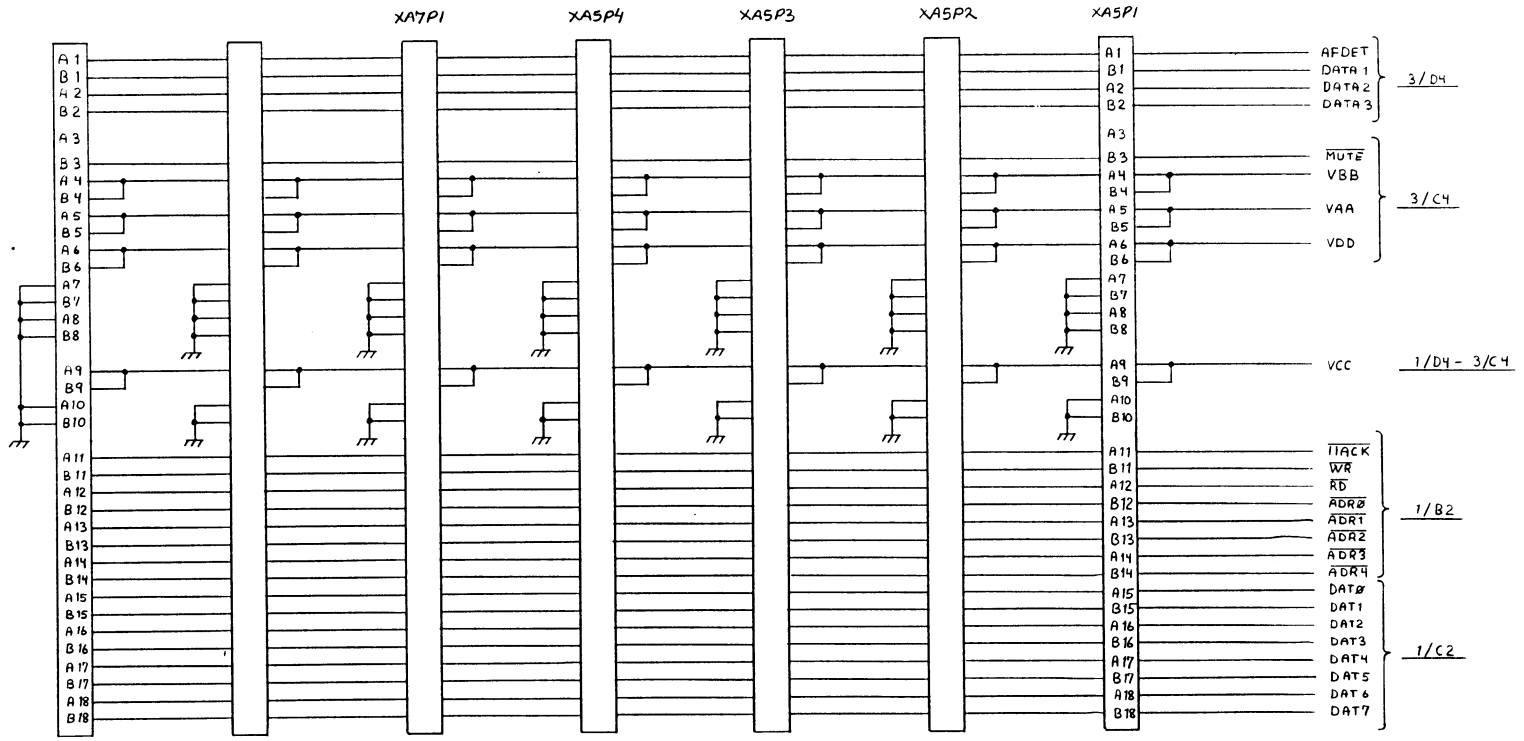
TITLE:

MOTHERBOARD
RC 4000

SIZE	CLASS:	NO.:
A2		47 19 25

SCALE: | SHEET 1 OF 3

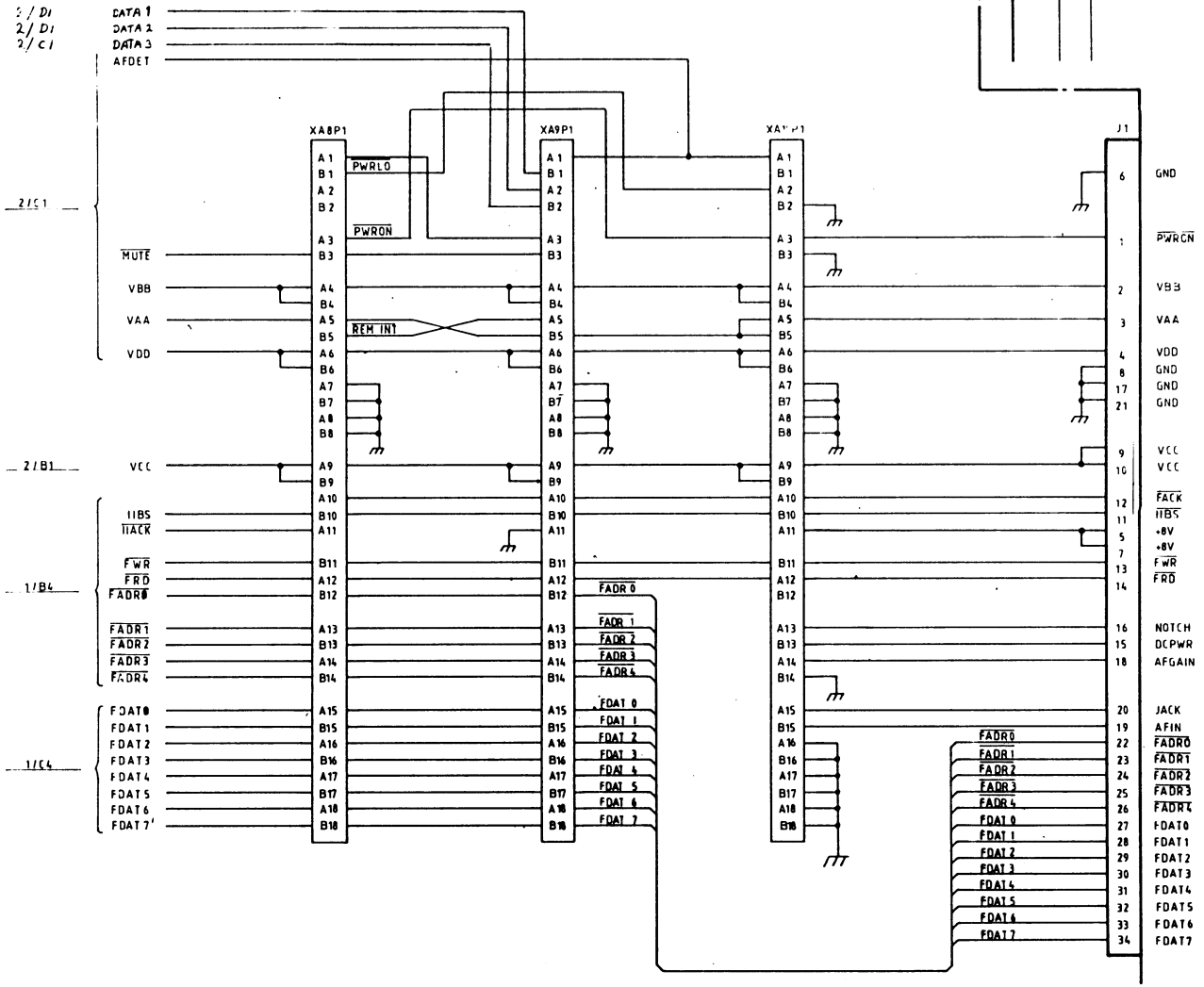
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	A			



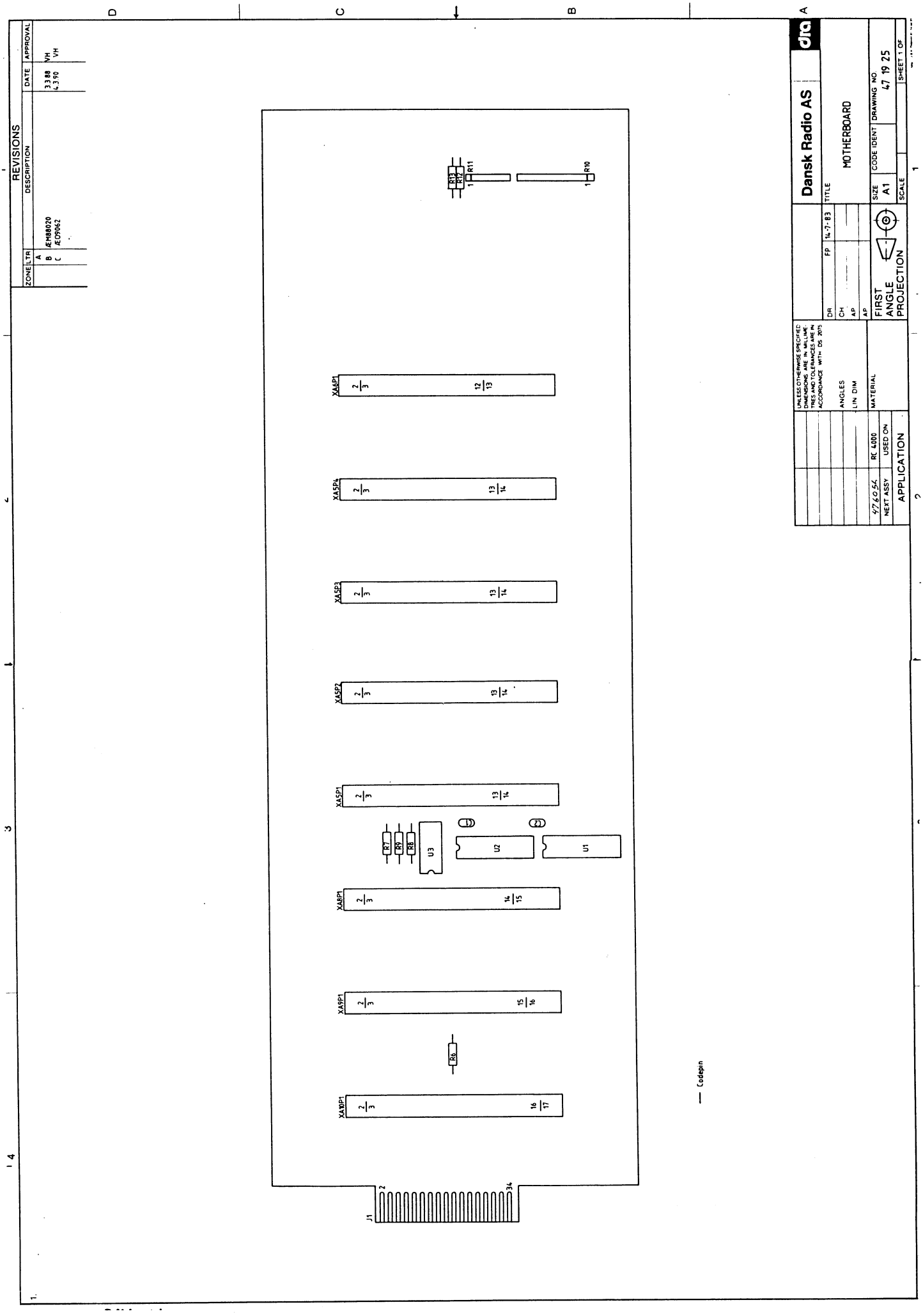
FIRST ANGLE PROJECTION	SIZE	CODE IDENT	DRAWING NO.
	A2		47 19 25
	SCALE		SHEET 2

Service Sheet A12A1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	A			
	B	ÆM88057	12.12.88	VH



FIRST ANGLE PROJECTION	SIZE A2	CLASS:	NO.: 47 19 25	
	SCALE:		SHEET 3	



Service Sheet A12A1