

MICRO DIATHERMY SYSTEM

Type 1100

SERVICE MANUAL



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D.O.R.C. MICRO DIATHERMY SYSTEM - Service Manual

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Section 1

GENERAL

The Dutch Ophthalmic Research Center (D.O.R.C.) is an innovative company that is involved in research, development and manufacturing of high quality instruments and equipment for ophthalmic surgery.

All D.O.R.C. products have been clinically tested before they were released to the ophthalmic surgeon.

D.O.R.C. plans to be able to be of service to the ophthalmic profession with even more innovative helpful products, for many years to come.

This Service manual should be helpful to you, while working with your D.O.R.C. MICRO DIATHERMY SYSTEM. Of course we are willing to listen to any possible suggestions that make the Service Manual even more useful.

Section 2

SPECIFICATIONS

GENERAL:

Apparatus	:	MICRO DIATHERMY SYSTEM
Type	:	Type 1100
Weight	:	5,5 Kg
Dimensions	:	13 x 22,5 x 29 cm.

MAINS INPUT:

Mains supply	:	100-110 VAC (50/60 Hz) 230-240 VAC (50/60 Hz)
Fuses	:	2x at 100/110VAC 1 AT 2x at 230/240VAC 500 mAT
Power Consumption	:	45 VA

OUTPUT (values at room temperature)

RF output power	:	12 Watt (MAX.), see fig.1
RF Frequency	:	13.56 Mhz, Cristal controlled.

Diathermy Output

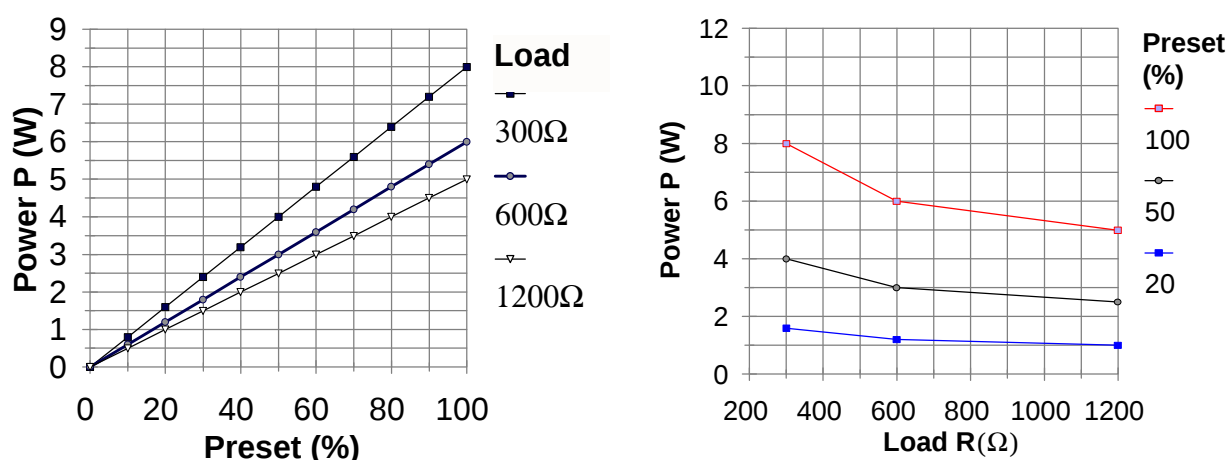


Figure 1 - Diathermy output

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AMBIENT CONDITIONS:

Operating temperature : 15-40°C
Humidity : 85% Max.

The D.O.R.C. Diathermy system complies with the safety standards as described in the international norm IEC601-1, Type BF, Class 1

Section 3

WARNINGS

A warning:

Indicates a potentially harmful situation to yourself or others.

Electric shock hazard

The Diathermy system contains high voltage circuits.



After performing any repair, calibration procedure performs a final electrical safety check and leakage current test.



Unplug the power cord before cleaning or servicing the unit. Should the power cord or plug become cracked, frayed broken or otherwise damaged, it should be replaced immediately.



Do not touch any exposed wiring or conductive surface, whilst the cover is off and the unit energized. The voltages present, when electric power is connected to the Diathermy system, can cause injury or death.



Never wear a grounding wrist strap when working on a energized unit.

The operator should now perform any servicing except as specifically stated in the Instruction Manual.



Do not, under any circumstances, perform any testing or maintenance on medical instruments, while they are being used to monitor a patient. Always turn the Diathermy system off before cleaning.

Explosion hazard



Never use this Diathermy system in the presence of flammable anaesthetics.

Section 4

CAUTIONS

A caution:

Indicates a condition that may result in equipment damage or malfunction.



Electrostatic discharge through the printed circuit boards will damage the components of the Diathermy system. Handle all circuit boards (replacements and defective) by their non-conductive edges and use anti-static containers when transporting them.

Before servicing the equipment, ground yourself and the tool to discharge any accumulated static charge by wearing a static control wrist strap. Use hospital-grade grounded receptacle only.

Servicing of this product, in accordance with the Service Manual, should never be undertaken in the absence of proper tools, test equipment and the most recent revision of the Service Manual, which must be clearly and thoroughly understood.

Do NOT apply tension on the line cord.

Check rear panel voltage setting before connecting the Diathermy system to AC main power.



NEVER IMMERSE THIS UNIT IN LIQUID !!

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Section 5

SHORT INSTRUCTIONS

NOMENCLATURE OF FRONT PANEL.

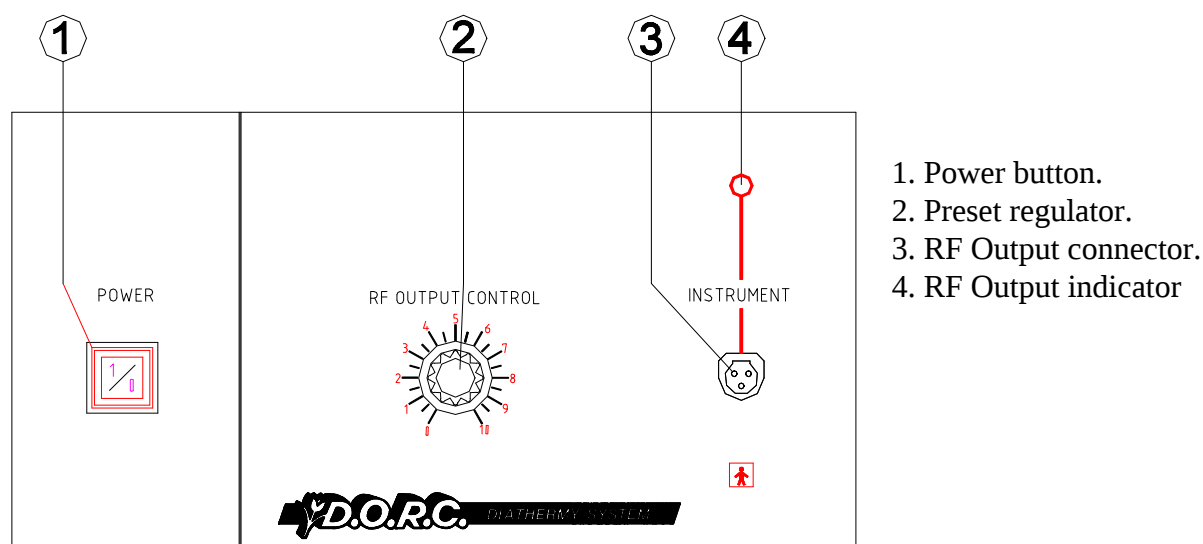


Fig. 2 Diathermy unit - Front Panel

NOMENCLATURE OF REAR PANEL.

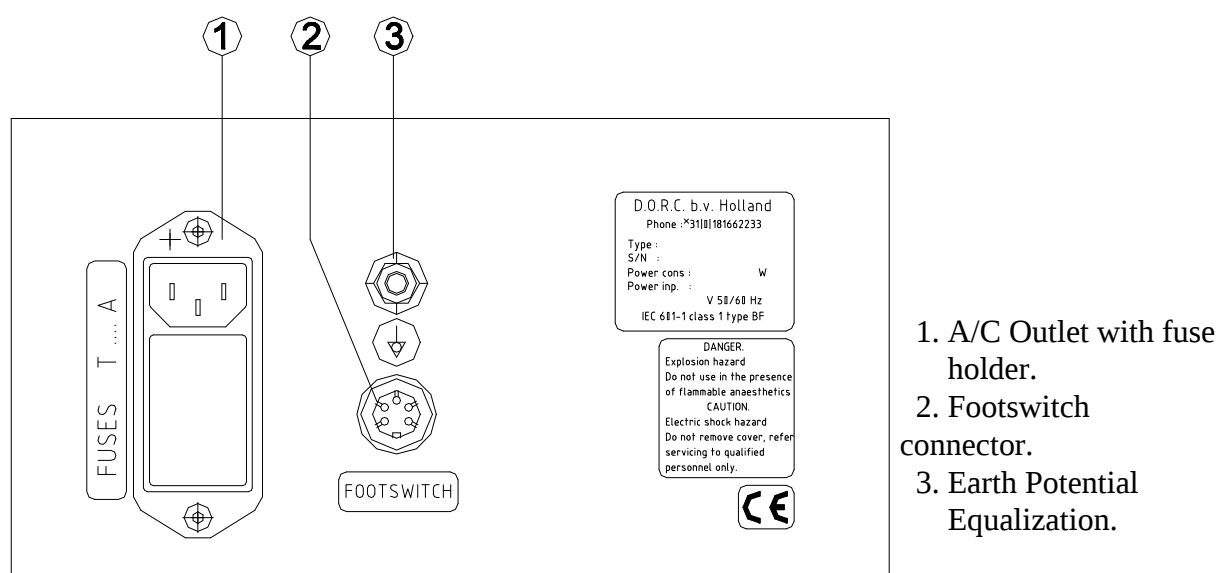


Fig. 3 Diathermy unit - Rear Panel

Section 7

SCHEMATIC DIAGRAMS

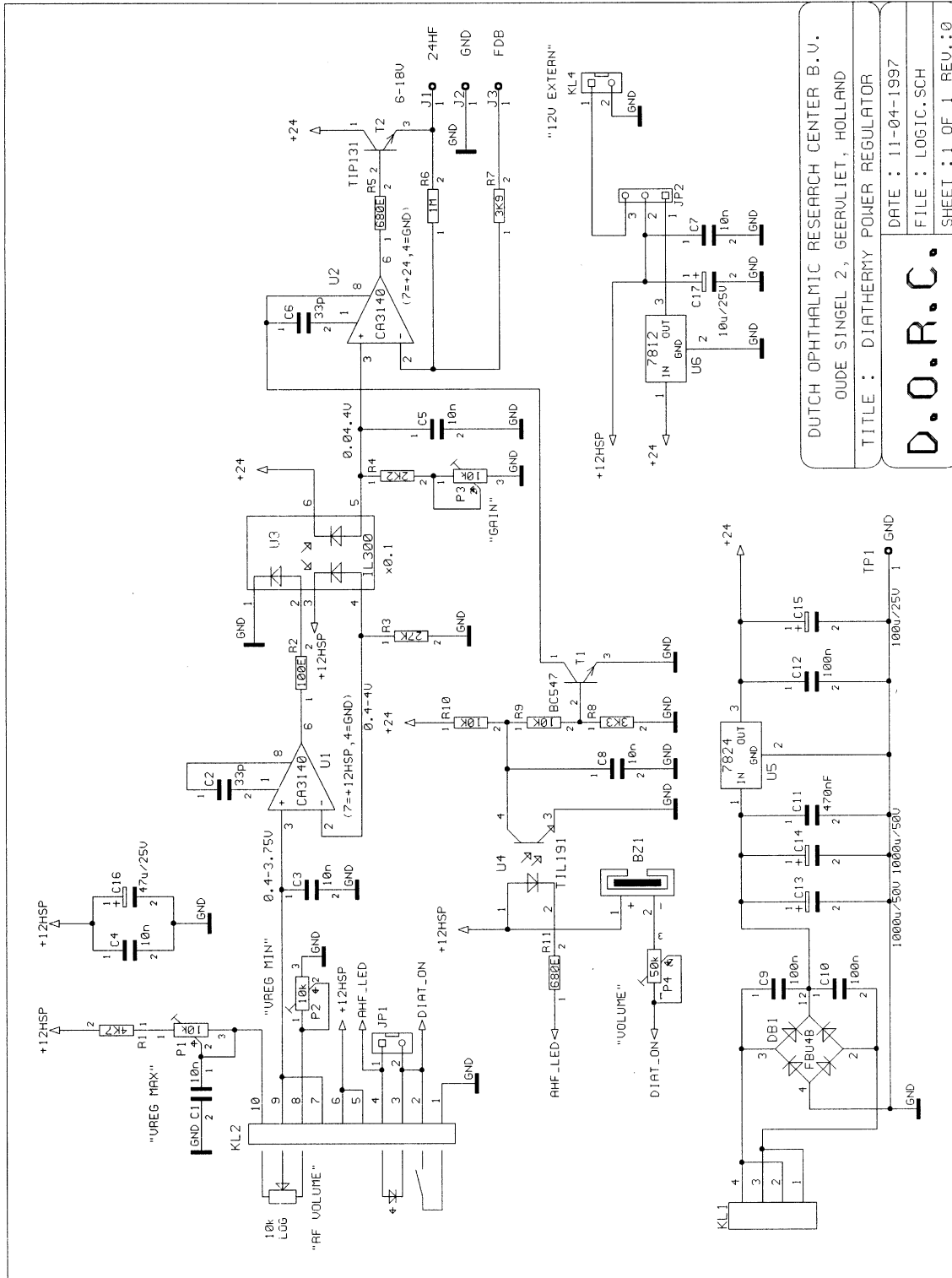


Fig.5 LOGIC PCB SCHEMATIC.

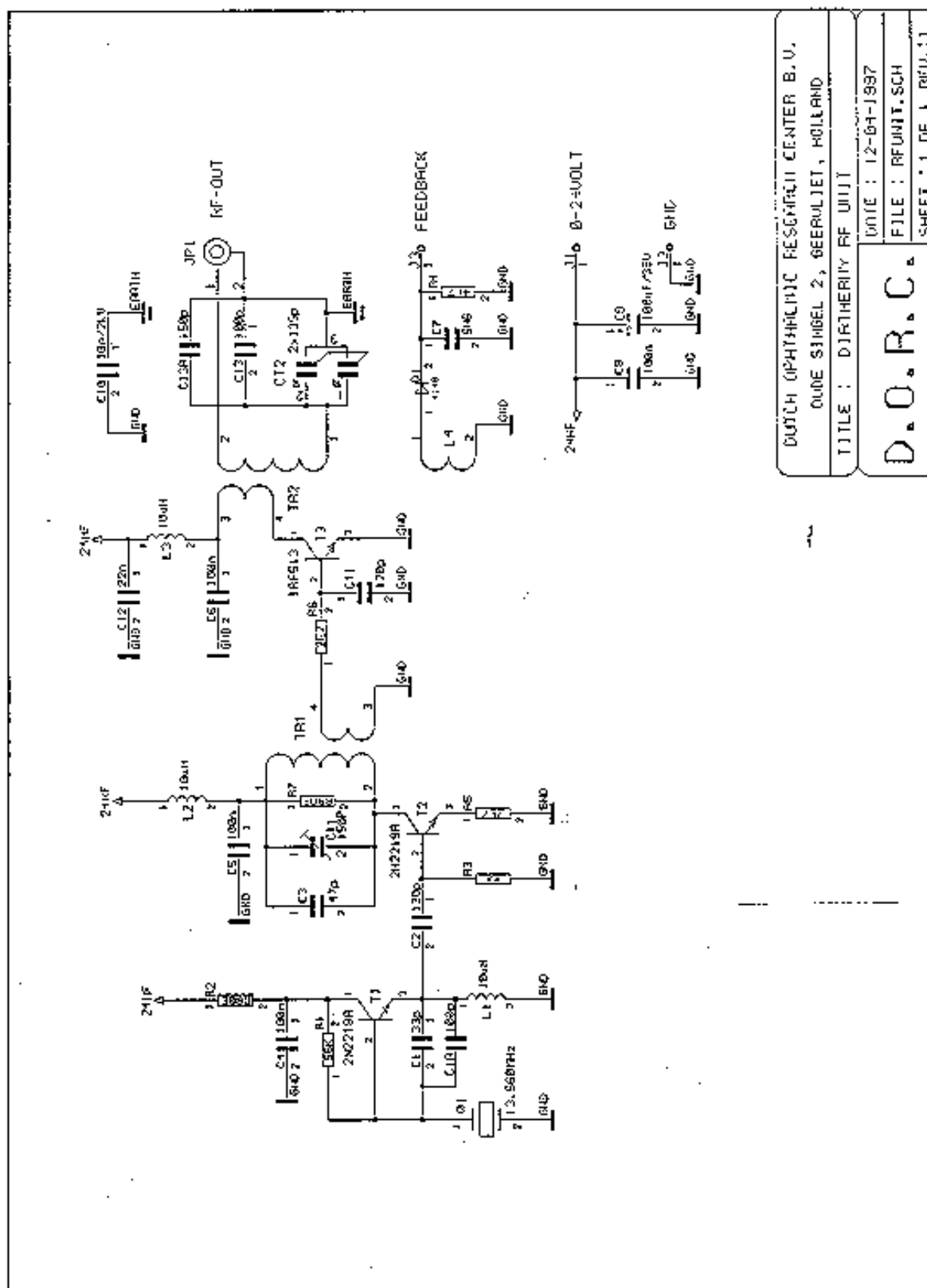


Fig. 7 RF-POWER PCB SCHEMATIC.

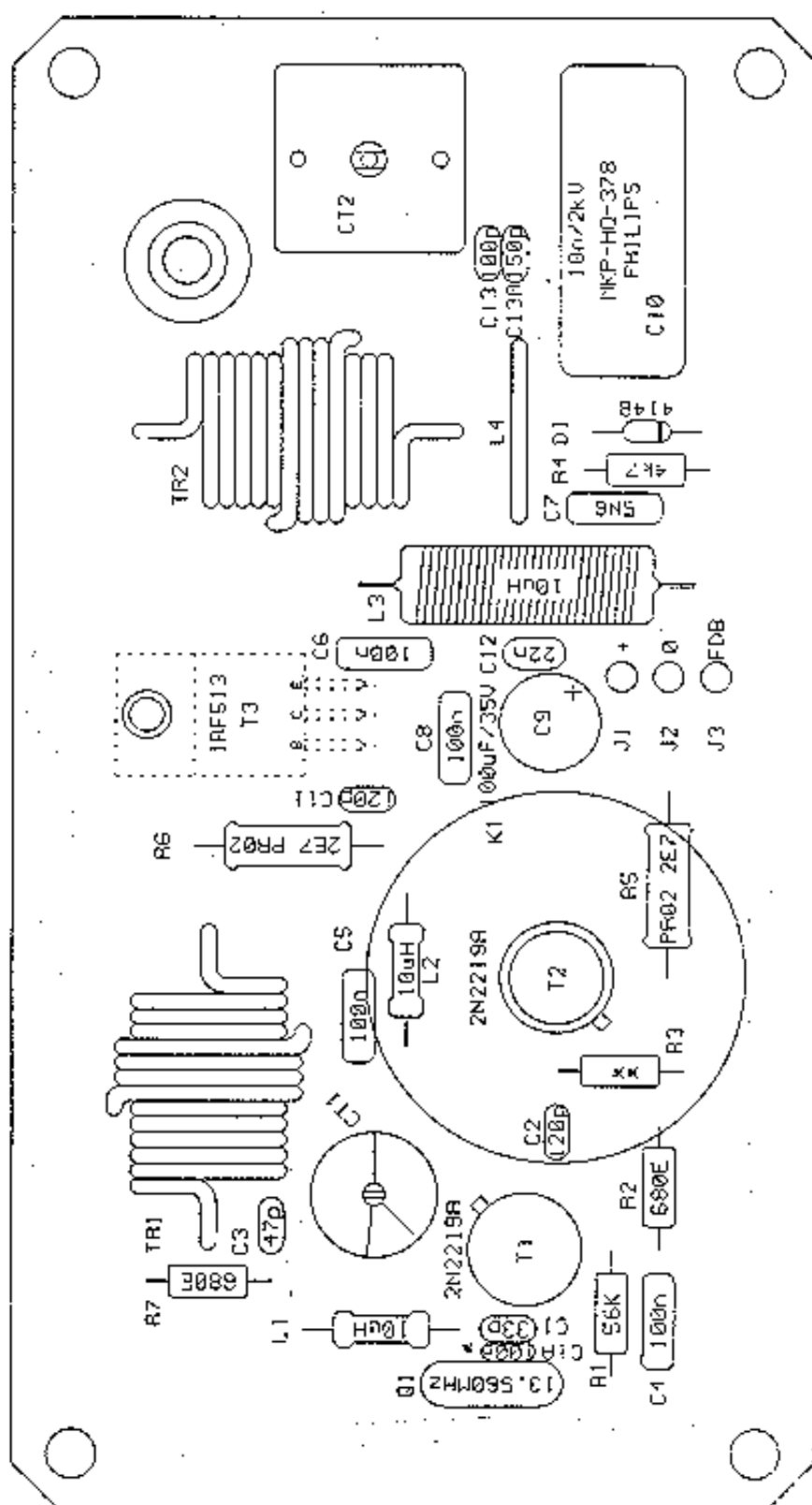


Fig. 8 RF-POWER PCB LAYOUT

Section 8

ADJUSTMENT MANUAL

GENERAL INFORMATION.

Warnings.



Before servicing, please read the information given in the chapter "WARNINGS" of this manual.

Technical assistance.

Assistance with servicing is available from D.O.R.C. INT. Service department either by letter to the following address or by Facsimile or Telephone.

Returns for repair or calibration.

To return a Diathermy system to the D.O.R.C. Service Department A written description including the following information must accompany all returned units:

- 1 The customer name, address and telephone number.
- 2 The customer account number.
- 3 A description of the problem or service desired.
- 4 The return authorization number.

Returned products should be shipped including footswitch and any handpiece which may be associated with the fault.

Replacement parts.

Replacement parts. may be obtained from the:

Dutch Ophthalmic Research Center International b.v.
Scheijdelveweg 2
3214 VN Zuidland
The Netherlands

Phone : (+31) (0) 181 45 80 80

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Introduction and applicability of this manual.

The service manual give the information required to maintain and repair the Micro Diathermy system . In order to understand this manual it is necessary to have a complete understanding of the functions of the Micro Diathermy system. This information can be obtained from the Instruction Manual of the Micro Diathermy system

Usually field service for Micro Diathermy system is limited to swapping the suspected circuit boards, measuring units etc.

Depending on the capabilities of the service facility, some repairs may not be possible ; e.g. troubleshooting the main modules of the Micro Diathermy system without proper test equipment and qualified personal. In such cases the faulty parts or the complete Micro Diathermy system should be send to D.O.R.C. International b.v.

General troubleshooting.

Field service of the Micro Diathermy system is intended to be done as board swapping where possible. The most important part of the trouble shooting is to pinpoint the faulty module, in most cases the main board. After any service, test procedure described in Appendix A should be carried out.

Section 9

SERVICING AND ADJUSTMENT

Recommended tools and test equipment.

ITEM	SPECIFICATION
1. Auto-Ranging Multimeter	Fluke Model 77 or equivalent.
2. Scopemeter	Fluke model 97 or equivalent.
3. Miniature Inspection Light	
4. Inspection mirror	
5. Set of Flat-tip Screwdrivers	Non-inductive
6. RF Powermeter	Contact your local dealer

Adjusting Logic

- Adjust with P2 the voltage on KL2 pin 9 of the preset button low to 0,3 Volt $\pm$ 0.05 Volt
- Adjust with P1 the voltage on KL2 pin 9 of the preset button high to 3,7 Volt $\pm$ 0.05 Volt
- Set Diathermy unit into minimum preset position Regulate P2 in such a way that the output will just start (measure the RF output with a suitable RF-meter).
- Adjust with P4 the loudness of the buzzer, during diathermy action, in a useful setting.

Adjusting RF Power

- Connect the Diathermy output to a non-inductive resistor of 600 Ω /25 Watt and measure the sinus output.(Preset level maximum).
- Adjust with CT1 & 2 the output to the most perfect sinus shape. See fig 2.

 Use for the next adjustment a suitable RF-powermeter or contact your local dealer.

- Connect the diathermy testcable between the unit and the RF-meter, use a LOAD of 600 Ω .
- Set Diathermy unit into maximum preset position, adjust the vario-capacitor (CT2) to maximum
- Set preset into midway position and regulate with CT 1 (the small vario-capacitor) to maximum RF output.
- Regulate with P3 the RF power to 6 W $\pm$ 20% (preset maximum).

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After previous adjustments are performed, check the following:

- Preset position "1" => the RF output has a value of maximum 1.5 W

If applicable, re-tune the RF output with P2.

Repeat if necessary adjustment procedure for an optimum result.

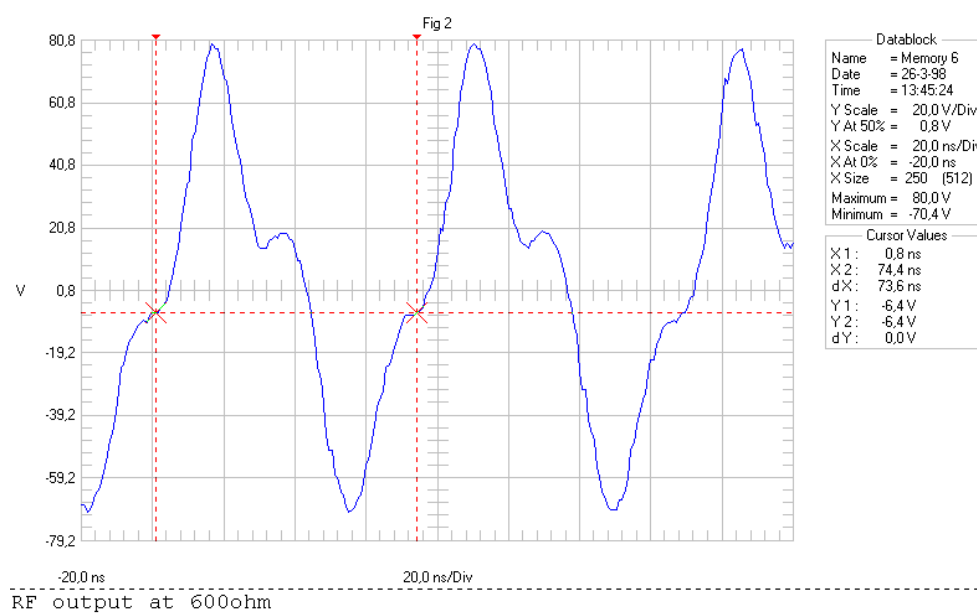


Fig. 9 - RF Output at maximum preset setting

Section 10

SPARE PARTS MANUAL

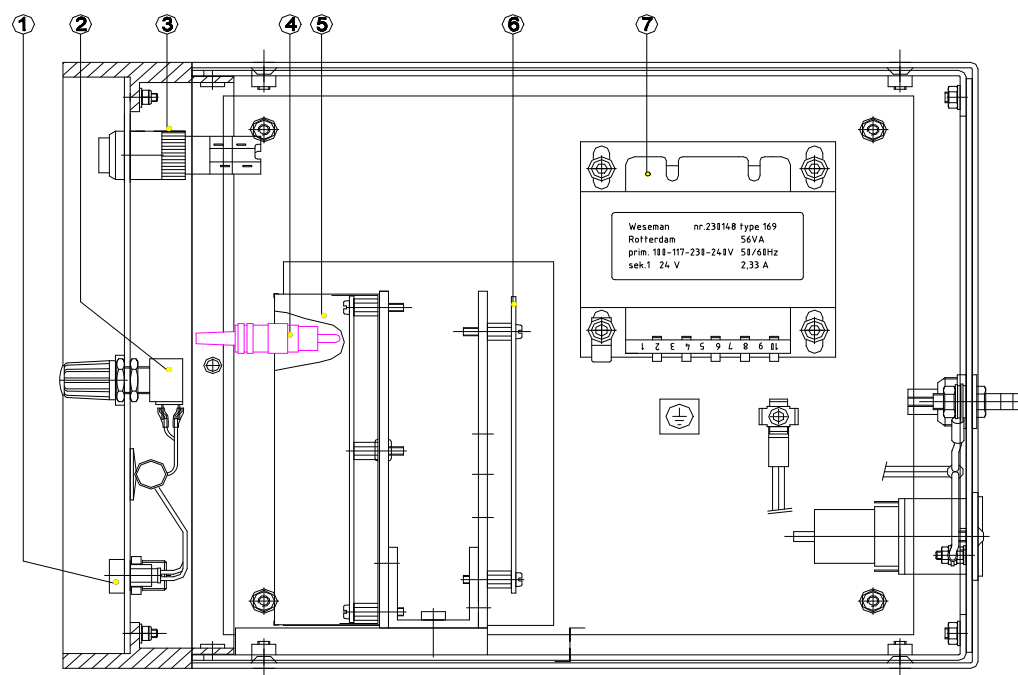


Fig. 10 Diathermy unit - Inside

Pos.	Description	Partnr.
1	Output connector	VNR0322
2	Preset potmeter	VNR0550
3	Main-switch	VNR0092
4	Coax connector	VNR0878
5/6	Diathermy Module	EV 826
7	Power transformer	VNR0169

APPENDIX A

After Service Test Procedure

The following test should be performed after any service to ensure proper operation of the system.

Check if the repaired module meets the specifications as described in the Service- or Instruction Manual.

Carry out the following Electric Safety check:

- Earth Leakage Current general.
- Enclosure Leakage Current
- Patient Leakage Current

Above tests should be performed in accordance with the requirements of IEC601-1 clause 19.