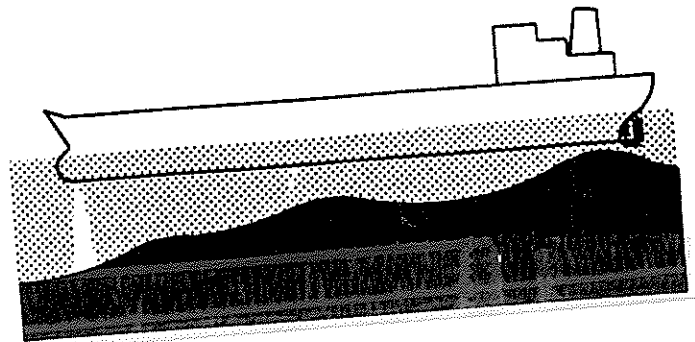
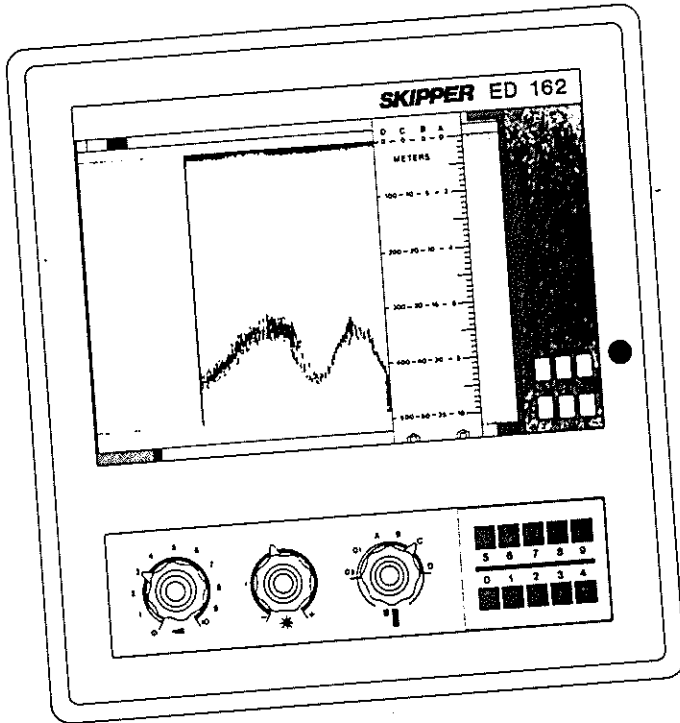


SKIPPER ED 162 NAVIGATION SOUNDER OPERATOR'S MANUAL

3004 E

FEBRUARY 1981



SKIPPER Electronics A/S
Ryensvingen 5
P.O.Box 151, Manglerud
0612 Oslo, Norway

Telephone: +47 23 30 22 70
Telefax: +47 23 30 22 71
E-mail: skipper@skipper.no
Co.reg.no: NO-965378847 - MVA

SKIPPER
www.skipper.no

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DIAGRAMS	
Alarm and digital depth display board.	
Expansion board.	
Recording amplifier.	
Expansion/compression board.	
Main control board.	
Power supply board.	
Inter-unit connections.	
Transmitter and receiver front-end.	

TECHNICAL SPECIFICATIONS

Scale range

Range setting	Range
01	Digital depth indicator 0-99.9 meters Recorder off
02	Digital depth indicator 0-500 meters Recorder off
A	0-10 meters
B	0-25 meters
C	0-50 meters
D	0-500 meters
	Feet, Fathom scales are available

Transmitter

Frequency	200 kHz
Output power	350 Watts
Pulse duration	
Range 01	0.6 milliseconds
02	3 milliseconds
A	0.2 milliseconds
B	0.4 milliseconds
C	0.6 milliseconds
D	3 milliseconds

Receiver

Frequency	200 kHz
Bandwidth	2 kHz
Bottom recording	Normal
TVG function	20 LogR Adjustable
TVG range	5-500 meters
Gain control	Continuous 30dB

Recorder

Type	6 inch (150 mm) Belt recorder
Paper speed	Continuously variable 1.2 - 12 mm/minute
Paper type	Dry TP 6 - T16
Pulses per minute	
Range 01	440 per minute
02	44 per minute
A-B-C	272 per minute
D	54.4 per minute

Voltage supply

Mains voltage	220 V AC or 11 - 40 V DC
Power Consumption	50 Watts

Transducer

Model	NGM 100-200-25L
Frequency	200 kHz
Type	Ceramic
Active face	123 mm circular
Beam width	6°
Housing	Steel tank, supplied by SKIPPER
Length of cable	25 meters

Miscellaneous

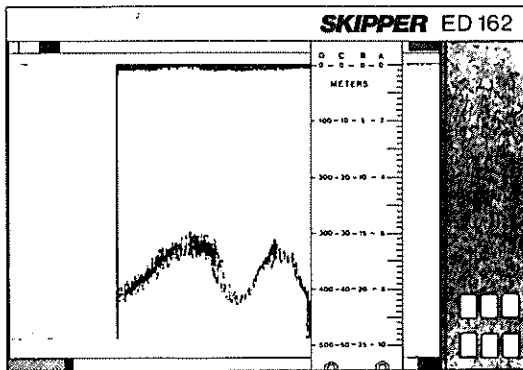
Digital Depth Indicator	
Range	1-99.9 meters 1-500 meters
Depth warning	
Range	1-500 meters
Mode	Decreasing depth
Warning	Audio-Visual
Dimensions of Cabinet	Height 350 mm Width 330 mm Depth 150 mm
Weight of Cabinet	Net 12 kg Gross 14 kg
Total gross weight of cabinet and transducer with steel tank	54 kg

Supplementary equipment

SKIPPER IR 201 Digital Depth Indicator with analog trend. This is a digital depth repeater for depths down to 500 meters (or equivalent depths in feet or fathoms).

OPERATION

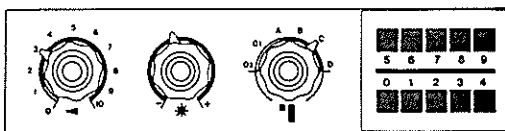
External controls



Push to open cabinet

Digital depth indicator

Depth warning indicator



Illumination control.

The illumination control provides continuous regulation of the illumination of the echogram and the front panel controls. The illumination lamps will extinguish when the recorder is switched off.

Depth warning selector.

This push-button selector provides setting of any warning depth down to 999 meters. The selected depth is shown on the depth warning indicator (Green figures). When the depth becomes less than the pre-set value a buzzer will start and the digital depth warning indicator will blink. The warning signals will stop when recorded depth is deeper than the pre-set warning depth, or when zero-setting the depth warning selector.

Range Selector Recorder On/Off.

This control selects the basic ranges according to the table given under technical specifications. In position 0 the recorder is switched off and the depth will be shown only on the digital depth indicator.

The depth warning and any remote depth indicators will be operational.

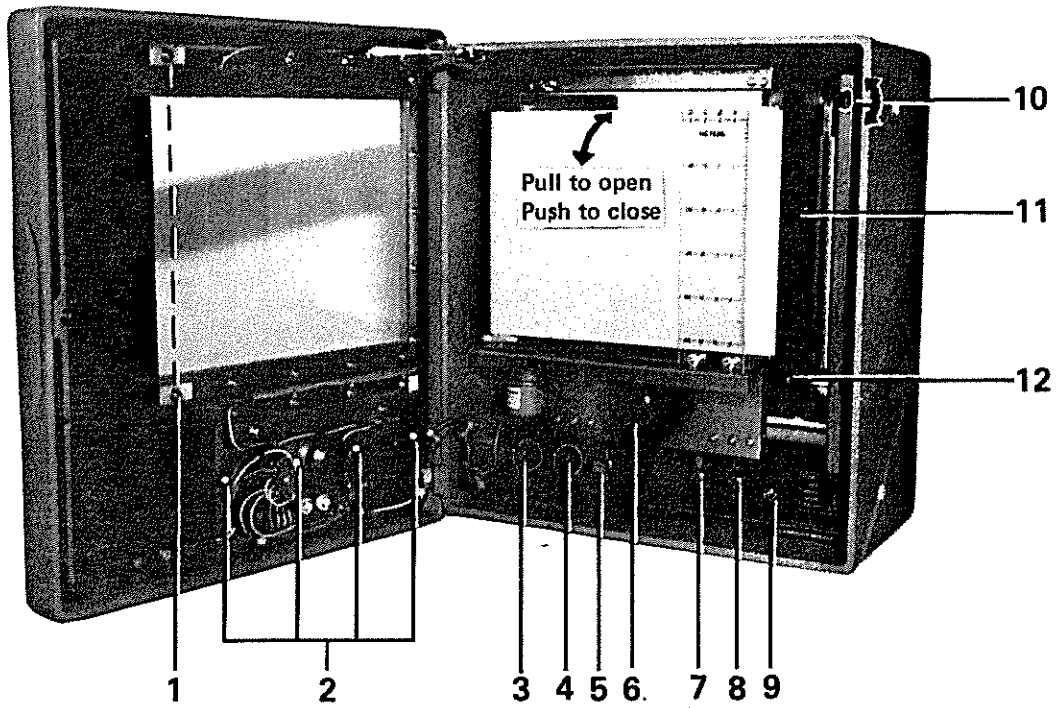
On/Off.

Receiver Gain Control

This control regulates the amplification of the received signals.

Correct setting: Turn the knob clockwise until a stable depth indication is obtained on the digital depth indicator. If the setting is too low the depth-indicator will start blinking. Too high setting may result in false depth indication from air bubbles, plancton layers, side lobes etc. By turning the control fully anti clockwise the echosounder is switched off.

INTERNAL CONTROLS



1 Scale illumination lamps

2 Control illumination lamps

3 Paper Speed Control
All ranges: 1.2 - 12 mm per minute continuously variable.

4 Time Varied Gain/TVG Control
Regulates the receiver amplification in the shallow water range.

5 Marker Control
A black line is drawn across the echogram when the knob is depressed.

6 Audio Alarm

7 Depth Warning Audio - On/Off

8 Mains selector

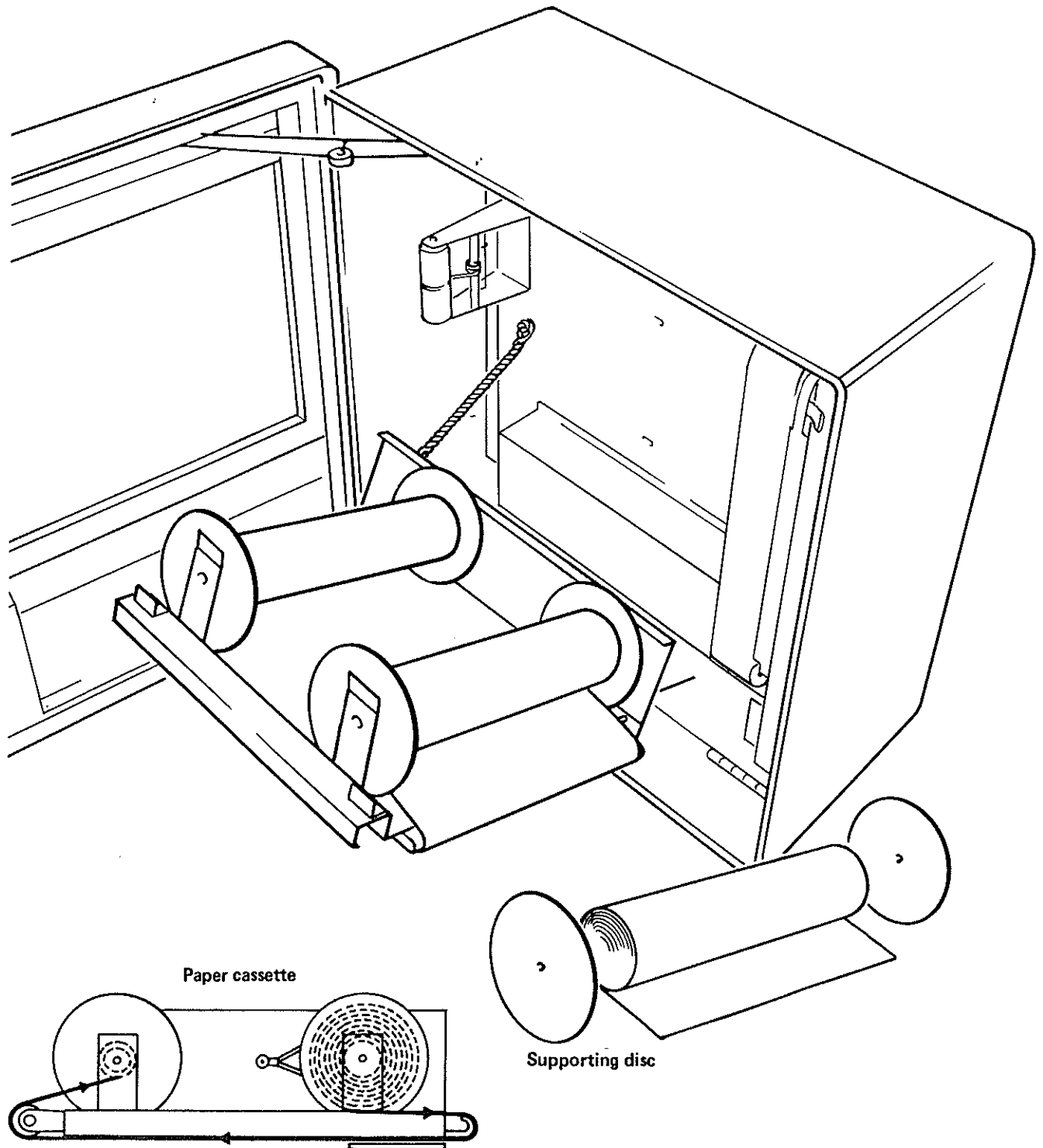
9 Fuse holder
Fuses:
12 V - 4 A 32 V - 1.5 A
24 V - 2 A 220 V - 0.3 A

10 Zero-Line adjuster
For adjustment of the zero-line to correspond with the scale.
By moving the zero-line downwards corresponding to the ship's (transducer's) draft true water depth is read on the echogram.

11 Recording stylus
Contact spring

12 Trigger magnet

REPLACEMENT OF RECORDING PAPER



1. Switch off the echosounder.
2. Rotate the pen belt so that the recording pen is located at the back.
3. Take hold of the top front of the paper cassette, pull it out and let it swing down carefully.
4. Pull out the end disc knob for the magazine and remove the used paper roll.
5. Transfer the empty spool from right to left side and make sure that the end supporting discs enter the spool.
6. Insert a new roll of recording paper and thread the paper as shown on the figure.
7. Thread the end of the paper into the slot in the paper spool and turn the spool to tighten the roll.
8. Lift and lock the paper cassette in the recorder.

MAINTENANCE

General

This chapter deals with the maintenance work that may be done by the user. Major repairs and overhauls should be left to an authorized SIMRAD service engineer.

Cleaning

Keep the cabinet clean and dry. If desired, the cabinet may be polished with a good car wax. Take care not to wax the acryl window and front plate. This should be cleaned with ordinary soap and a wet cloth.

The transducer normally needs little attention. However, the radiating face should be cleaned when docking. Use syntetic soap. Marine growth may be removed with a piece of wood, whereupon the radiating face is carefully cleaned with fine-grade sand paper or emery paper.

The radiating face must not be painted

The recorder should be cleaned at regular intervals. A brush is fine for this purpose.

Oiling

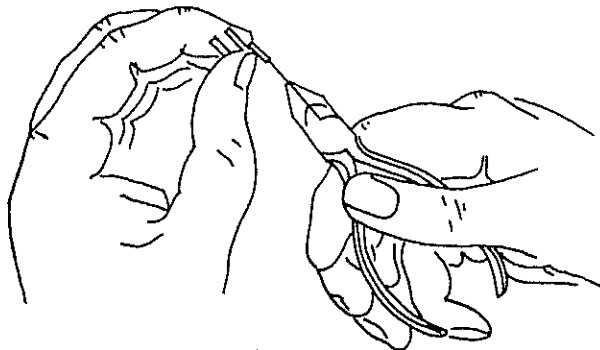
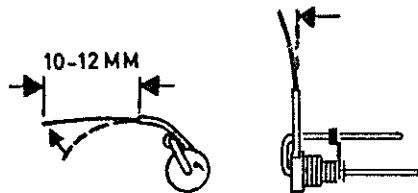
Normally no oiling and greasing is required. If necessary apply only one drop of oil on moving parts.

Adjusting the recording pen

The recording pen has a magazine of thin steel wire which must be pulled out when the tip is worn down. This is usually done every time a new roll of paper is inserted.

1. Switch off the echosounder, open the cabinet door and rotate the penbelt till the pen is in front.
2. Remove the pen from its beltholder.
3. Hold the pen as shown with a pair of pliers. Pull the wire slowly out from the thin guiding tube. Be careful not to damage the tube. Total length of wire outside the tube should be 10 - 12 mm (3/8 - 1/2 in). If the wire has been pulled out too far, cut to correct length.
4. Straighten the wire as an extension of the guiding tube.

The pen should be bent slightly to the left.



Spare Parts

With the echosounder a spare part kit is supplied:

- 10 ea fuses
- 2 ea scale lamps
- 2 ea recording pens
- 1 ea trailing contacts

Spare part Reg. No. 160-1
Replacing fuses.

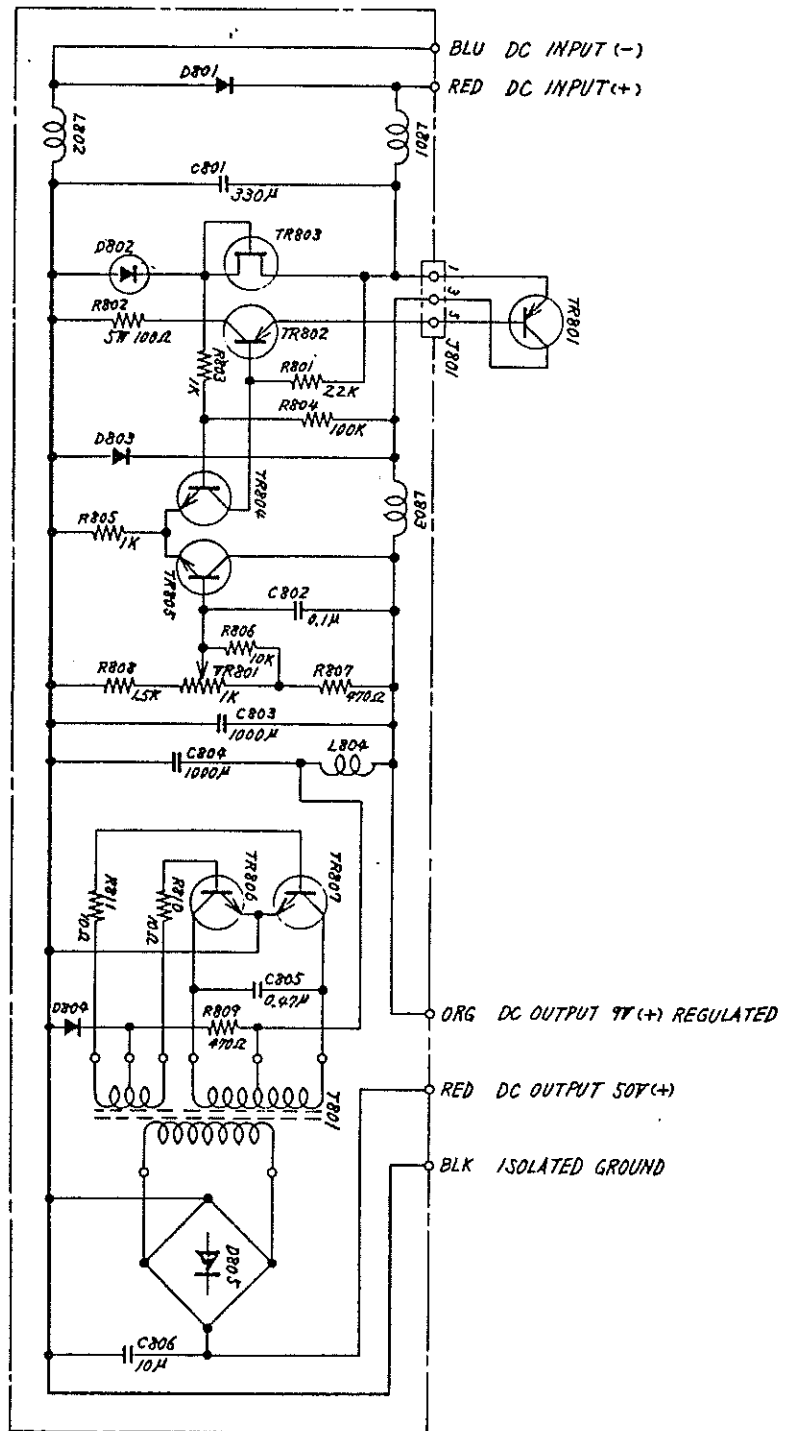
SIMRAD ED 161 has one fuse which is located inside the cabinet. Switch off the echosounder before carrying out any replacement

- | | |
|------------|---------------|
| 12 V - 4 A | 32 V - 1.5 A |
| 24 V - 2 A | 220 V - 0.3 A |

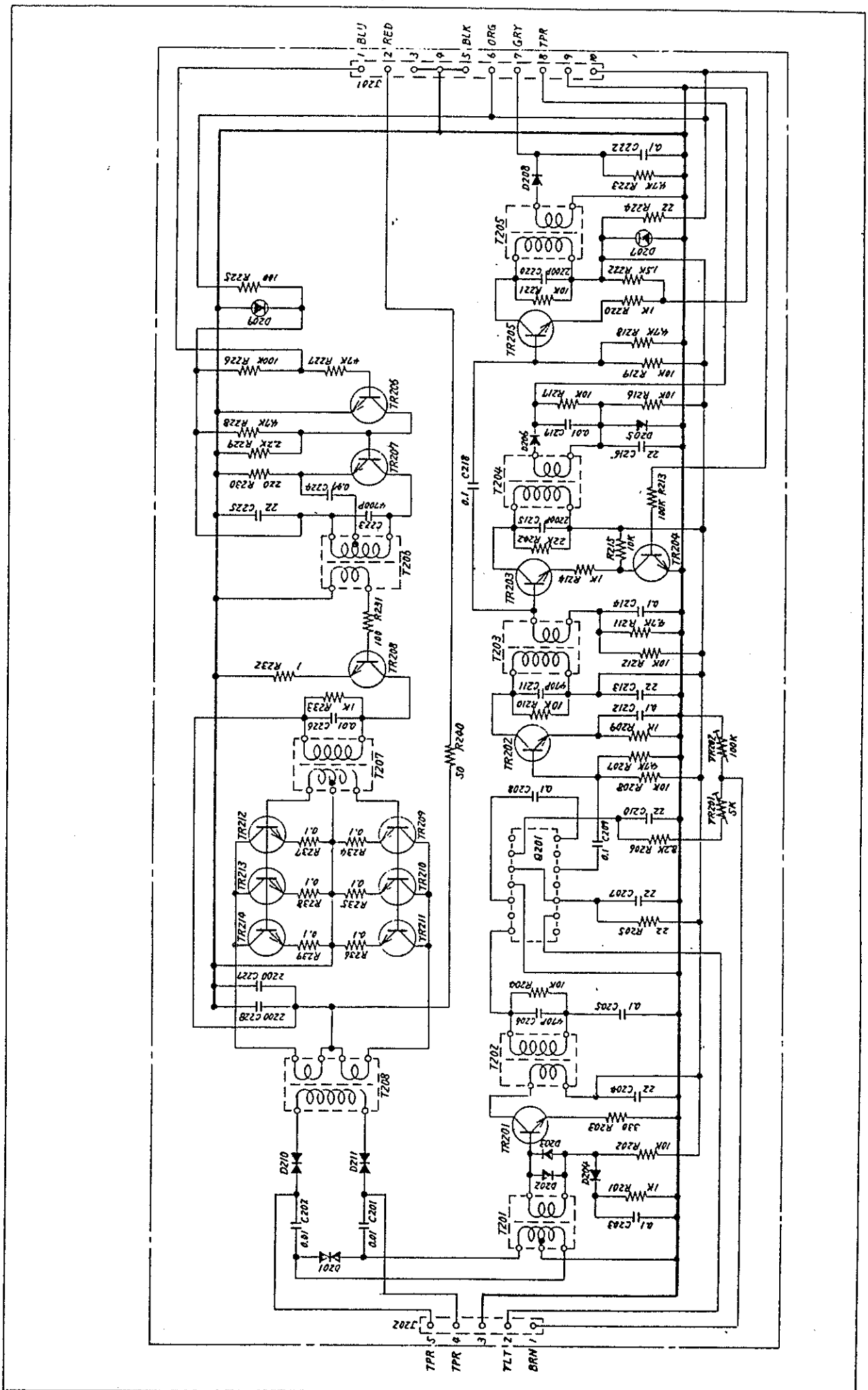
Replacing illumination lamps

SIMRAD ED 161 is furnished with 6 illumination lamps located inside the front door.

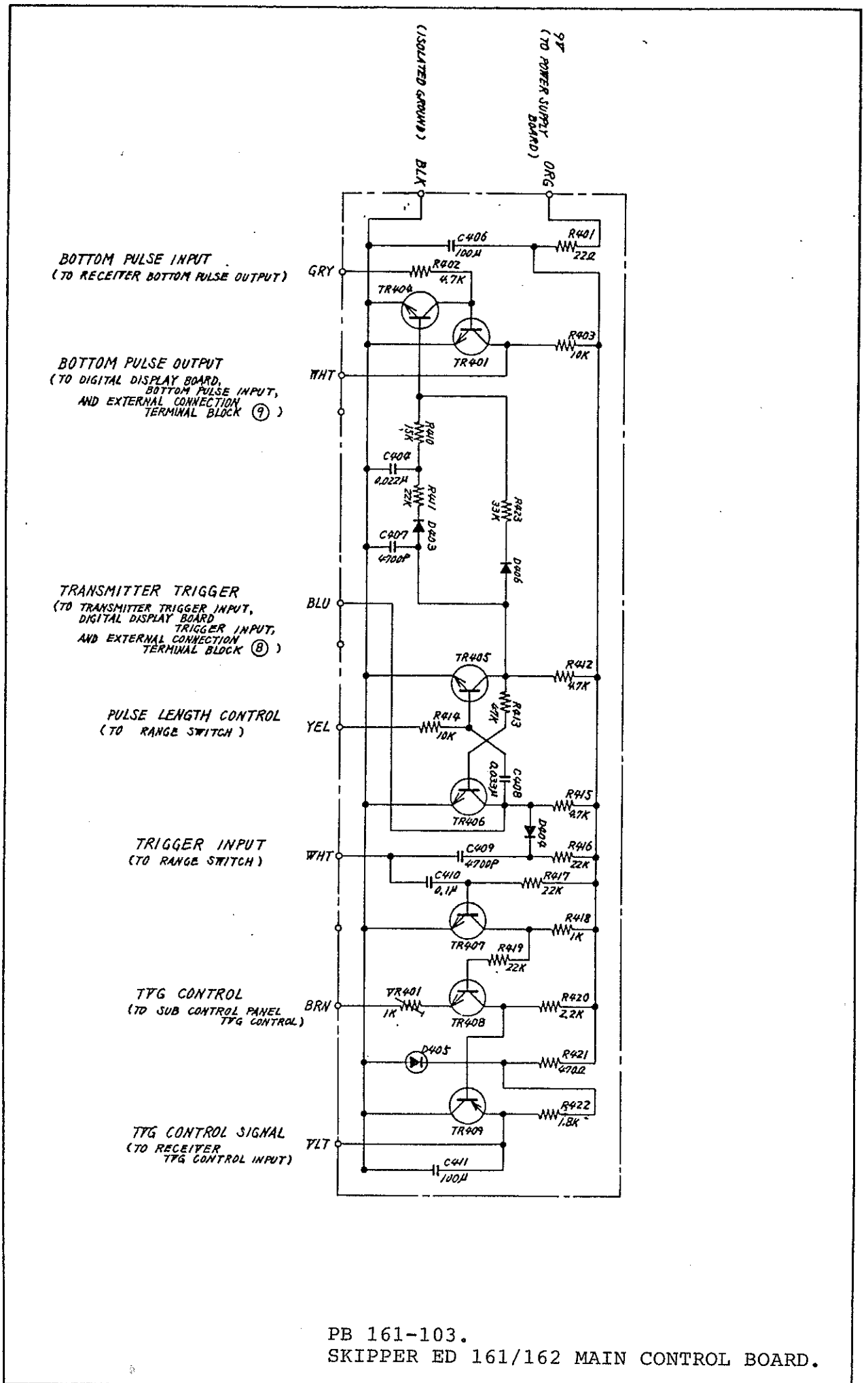
Switch off the echosounder before carrying out any replacement.



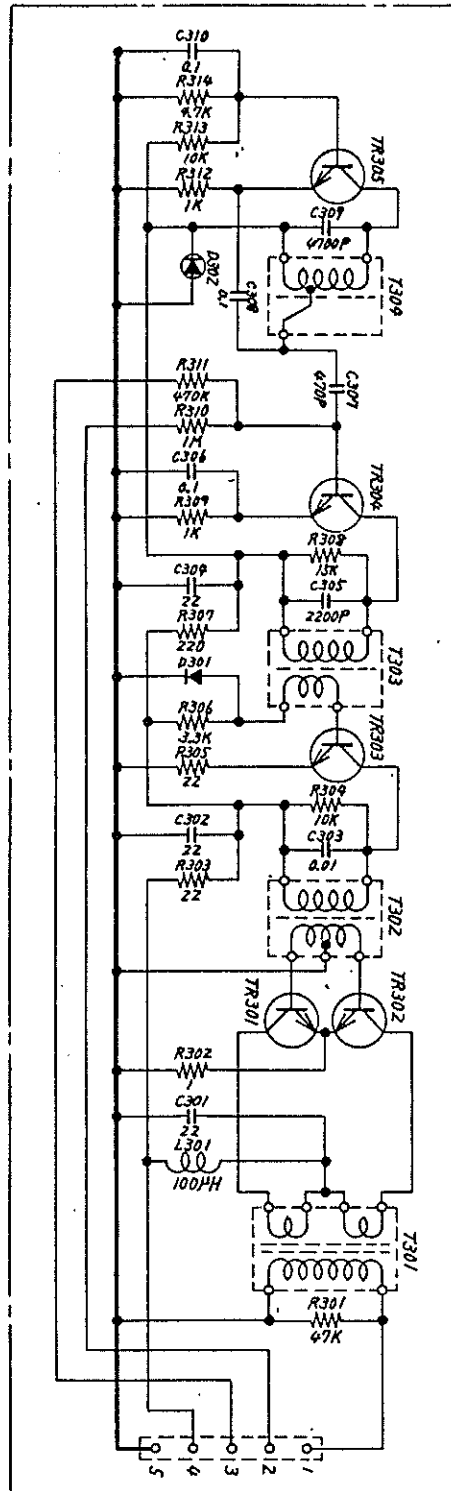
PB 161-127.
SKIPPER ED 161/162 POWER SUPPLY BOARD.



PB 162-108.
 SKIPPER ED 162 TRANSMITTER & RECEIVER BOARD

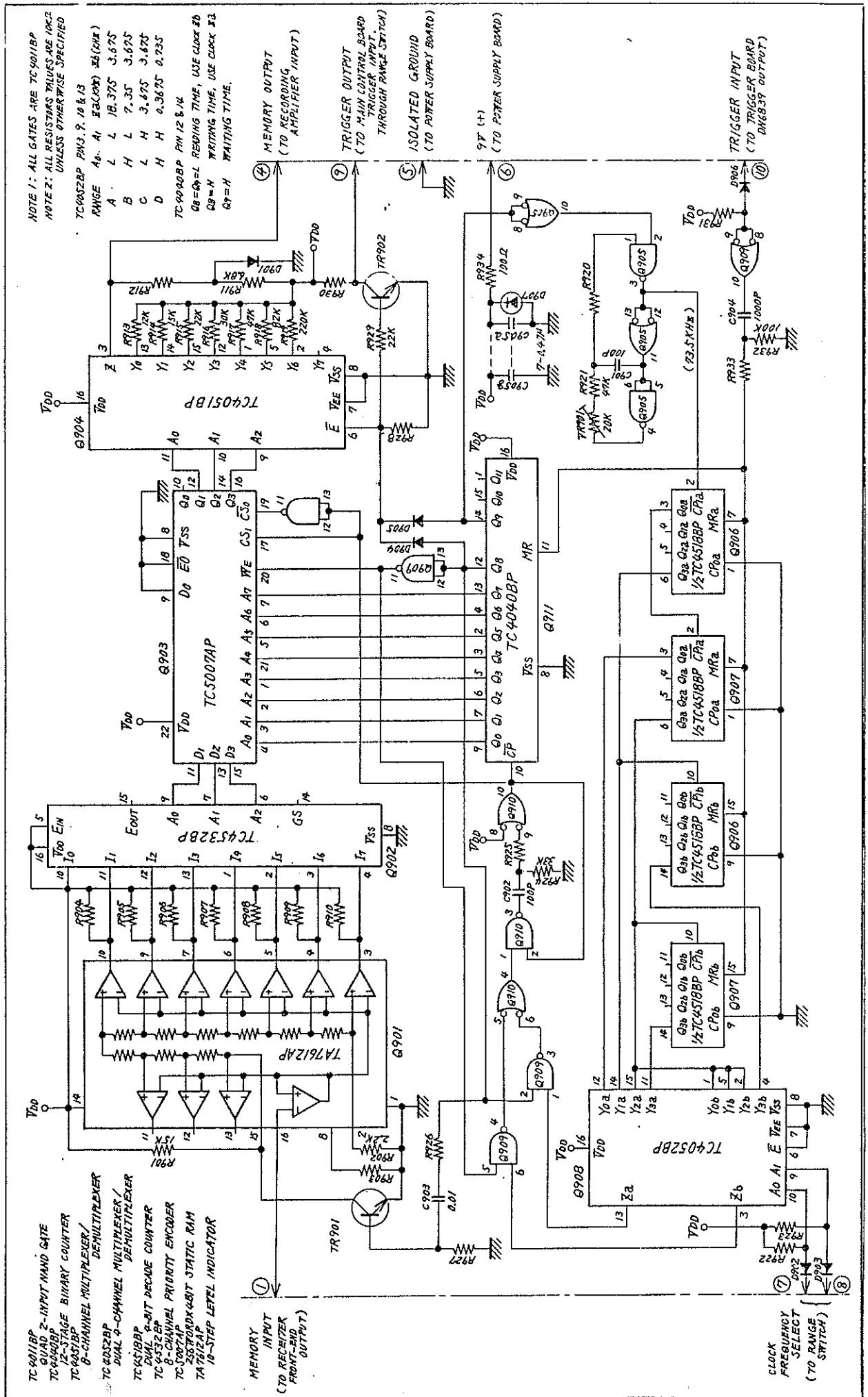


PB 161-103.
SKIPPER ED 161/162 MAIN CONTROL BOARD.



01 GRY RECORDING OUTPUT
 02 WHT RECORDING INPUT
 03 YEL MARKER INPUT
 04 RED 9T LINE / SWITCHD
 05 BLK ISOLATED GROUND

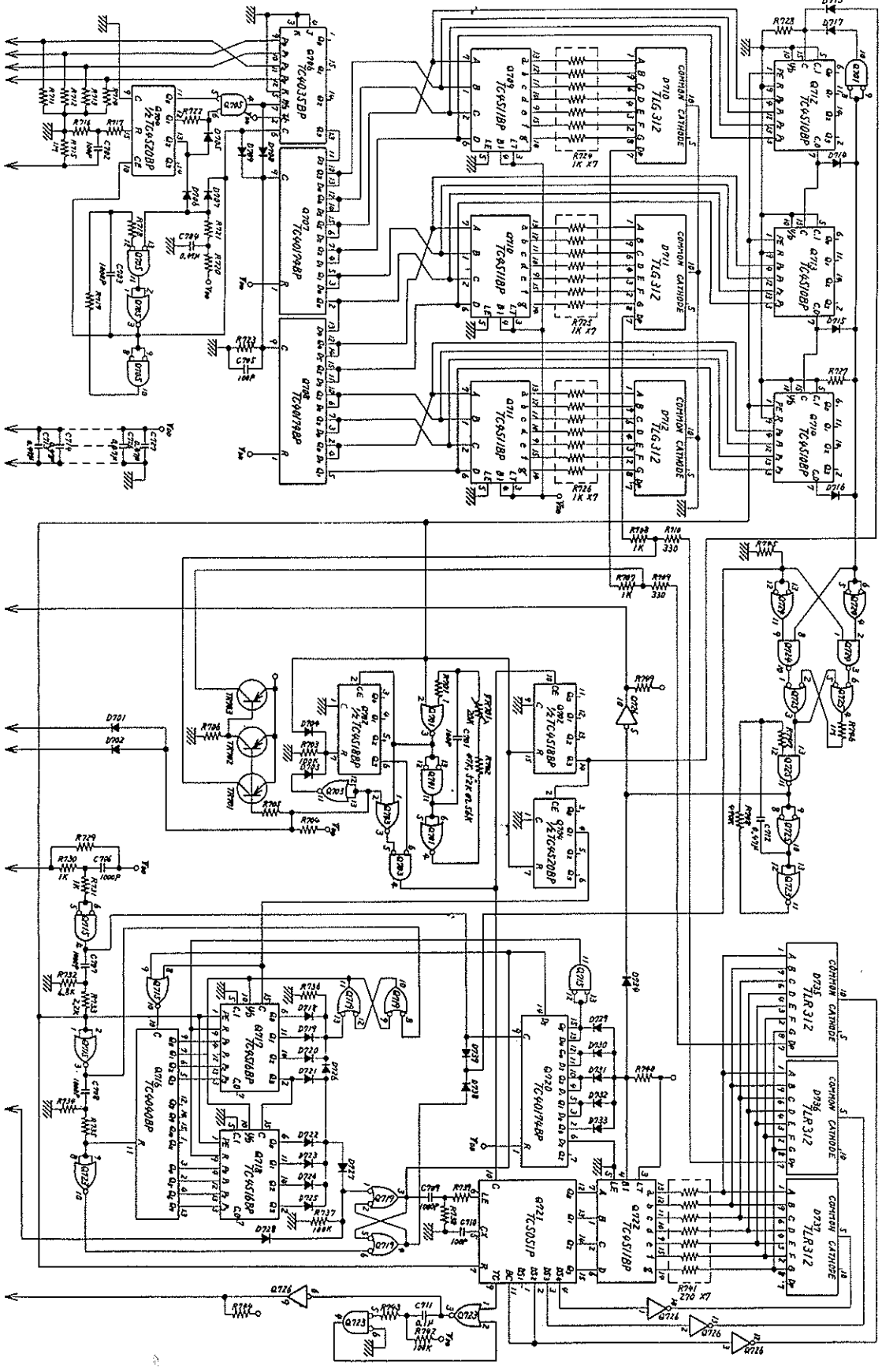
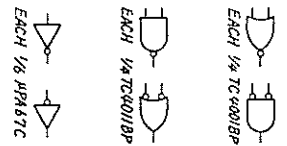
PB 802-109.
 SKIPPER ED 161/162 RECORDING AMPLIFIER.



TC 9011BP QUAD 2-INPUT NOR GATE
 TC 4011BP QUAD 2-INPUT NAND GATE
 TC 4035BP 4-BIT PARALLEL IN / PARALLEL OUT SERIAL RIGHT SHIFT REGISTER
 TC 4040BP 2-STAGE BINARY COUNTER
 TC 6510BP PRESETTABLE BCD UP/DOWN COUNTER
 TC 6511BP BCD-TO-7-SEGMENT LATCH / DECODER / DRIVER
 TC 6512BP PRESETTABLE BINARY UP / DOWN COUNTER

TC 4518BP DUAL BCD UP COUNTER
 TC 4520BP DUAL BINARY UP COUNTER
 TC 40199BP HEX D FLIP-FLOP
 TC 5051P 4-DIGIT BCD COUNTER WITH BLANKING CONTROL
 TG 6312 4-DIGIT BCD COUNTER WITH BLANKING CONTROL
 TR 312 RED 7-SEGMENT LED DRIVER TRANSISTOR ARRAY
 JH451C

NOTE 1: ALL RESISTOR VALUES ARE OHMS UNLESS OTHERWISE SPECIFIED
 NOTE 2: CLOCK FREQUENCY 2.33KHZ AT Q202 (TC 4518BP) & (Q2)



①③③③③ PARALLEL IN/VT RESET/PARALLEL-TO-SERIAL BCD CODE CONVERSION INITIATE (TO ENCODER BOARD)

② 9P ISOLATED GROUND

① ELECTRIC BUZZER (INTERMITTENT ON / HIGH OFF / LOW)

②③③③③ CLOCK FREQUENCY SELECT (TO RANGE SELECTOR)

② TRIGGER IN/VT (TO MAIN CONTROL BOARD)

② TRIGGER OUTPUT (TO RANGE SELECTOR)

PB 161-123, SKIPPER ED 161/162 ALARM & DIGITAL DEPTH READOUT BOARD.