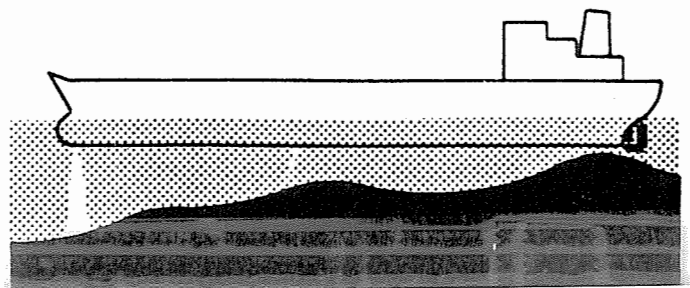
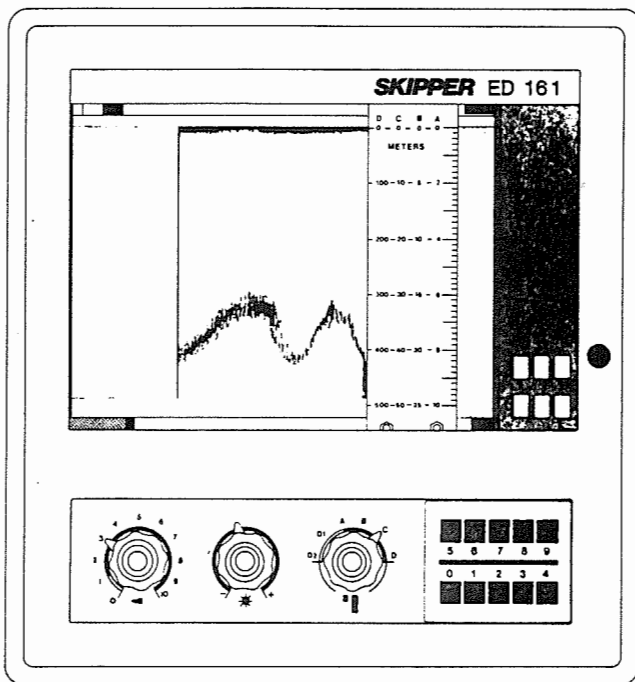


# **SKIPPER** ED 161 NAVIGATION SOUNDER OPERATOR'S MANUAL

3003 E

FEBRUARY 1981



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<b>CONTENTS</b>	<b>Page</b>
<b>TECHNICAL SPECIFICATIONS</b>	<b>2</b>
Scale range	2
Transmitter	2
Receiver	2
Recorder	2
Voltage Supply	2
Miscellaneous	2
Transducers	2
Supplementary equipment	2
<b>OPERATION</b>	<b>3</b>
External controls	3
On/Off, Receiver gain control	3
Illumination control	3
Range selector, Recorder On/Off	3
Depth warning selector	3
Internal controls	4
Paper speed	4
Time Varied Gain control	4
Marker Control	4
Depth warning Gain control	4
Mains selector	4
Fuse holder	4
Zero line adjuster	4
Replacement of recording paper	5
<b>MAINTENANCE</b>	<b>6</b>
General	6
Cleaning	6
Oiling	6
Spare parts	6
Replacing fuse	6
Replace illumination lamps	6
Adjusting the recording pen	6
<b>DIAGRAMS</b>	
Recording amplifier.	
Main control board.	
Power supply board.	
Inter-unit connections.	
Transmitter and receiver front-end.	
Alarm and digital depth read-out board.	

## TECHNICAL SPECIFICATIONS

SKIPPER ED 161 Navigation Echosounder is designed to meet the IMCO recommendations for echosounders in merchant vessels.

### Scale range

Range setting	Range
0	Digital depth indicator 0-999 meters, Recorder Off
A	0 - 50 meters
B <sub>1</sub>	0 - 500 meters
B <sub>2</sub>	300 - 800 meters
B <sub>3</sub>	600 - 1100 meters

Feet/Fathom scales are available.

### Transmitter

Frequency	50 kHz
Output power	350 Watts
Source level (50 kHz)	107 dB/1 $\mu$ Bar ref. 1 m
Pulse duration	Range 0 and A - 0.6 msec. All B ranges - 3.0 msec.

### Receiver

Frequency	50 kHz or 70 kHz
Bandwidth	1.5 kHz
Bottom recording	Normal
TVG function	20 LogR Adjustable
TVG range	5 - 1000 m
Gain control	Continuous 30 dB

### Recorder

Type	6 inch belt recorder
Paper speed	Continuously variable Range A: 6 - 12 mm/min. Range B: 1.2 - 2.4 mm/min.
Paper type	Dry, TP6 - T16
Pulses per minute	Range 0 - 44 Range A - 272 Range B - 27.2

### Voltage supply

Mains voltage	220 V AC/11 - 40 V DC
Power consumption	50 Watts

### Transducers

Model	TGM 60-50-25L
Frequency	50 kHz
Type	Ceramic
Active face	70 mm circular
Beam width	30 degrees
Housing	Steel tank
Length of cable	25 m

### Miscellaneous

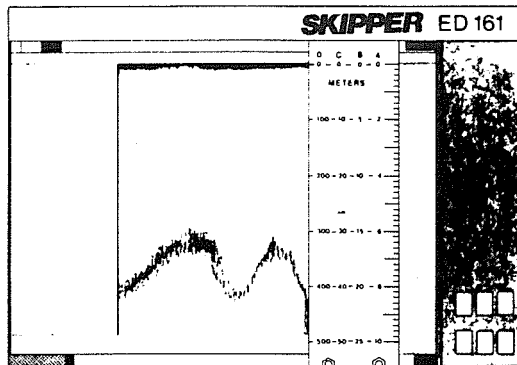
Digital Depth Indicator	
Range	1-999 m
Depth warning	
Range	1-999 m
Mode	Decreasing depth
Warning	Audio/Visual
Dimensions of cabinet	
Height	350 mm
Width	330 mm
Depth	150 mm
Weight of cabinet	
Net	12 kg
Gross	14 kg
Total gross weight of cabinet and transducer	
50 kHz with steel tank	40 kg

### Supplementary Equipment

SKIPPER IR 201 Digital Depth Indicator with analog trend.  
Digital Depth repeater for depths down to 999 meters or equivalent recordings in feet or fathoms.

# OPERATION

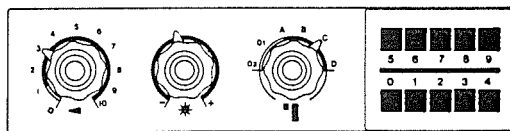
## External controls



Push to open cabinet

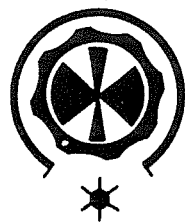
Digital depth indicator

Depth warning indicator



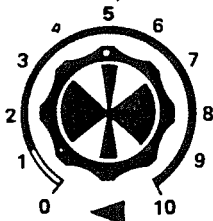
### Depth warning selector.

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.



### Illumination control.

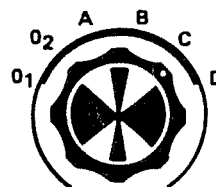
The illumination control provides continuous regulation of the illumination of the echogram and the front panel controls. The illumination lamps will extinguish when the recorder is switched off.



### On/Off. Receiver Gain Control.

This control regulates the amplification of the received signals.

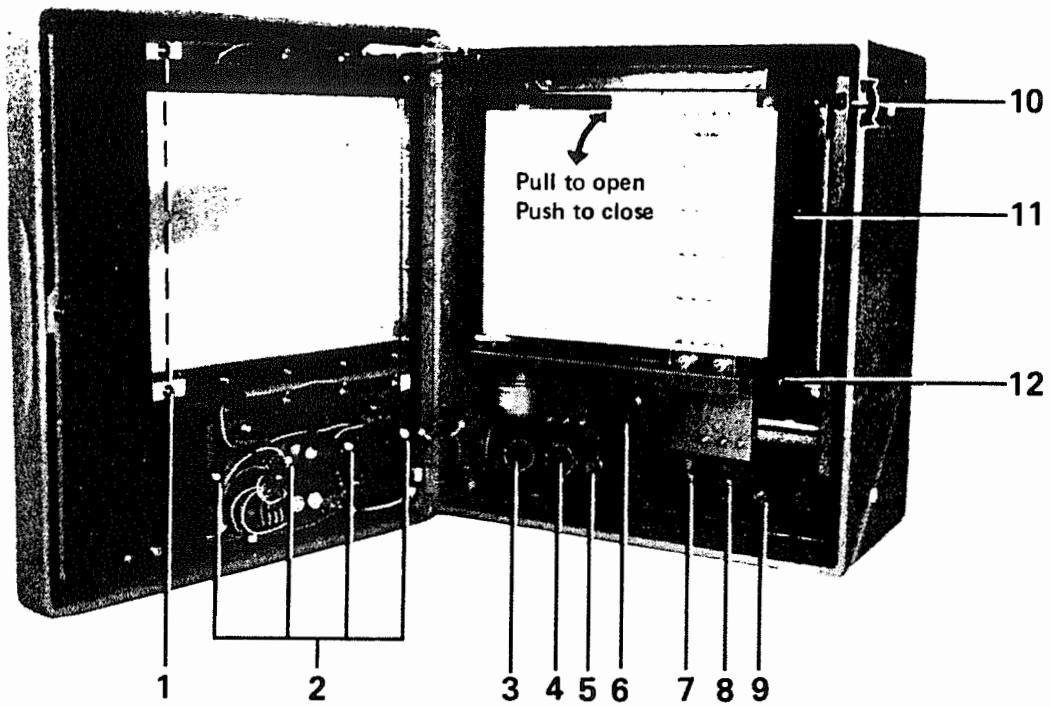
Correct setting: Turn the knob clockwise until a stable depth indication is obtained on the digital depth indicator. If the setting is too low the depth-indicator will start blinking. Too high setting may result in false depth indication from air bubbles, plancton layers, side lobes etc. By turning the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



### Range Selector Recorder On/Off.

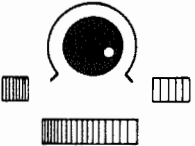
This control selects the basic ranges according to the table given under technical specifications. In position 0 the recorder is switched off and the depth will be shown only on the digital depth indicator. The depth warning and any remote depth indicators will be operational.


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

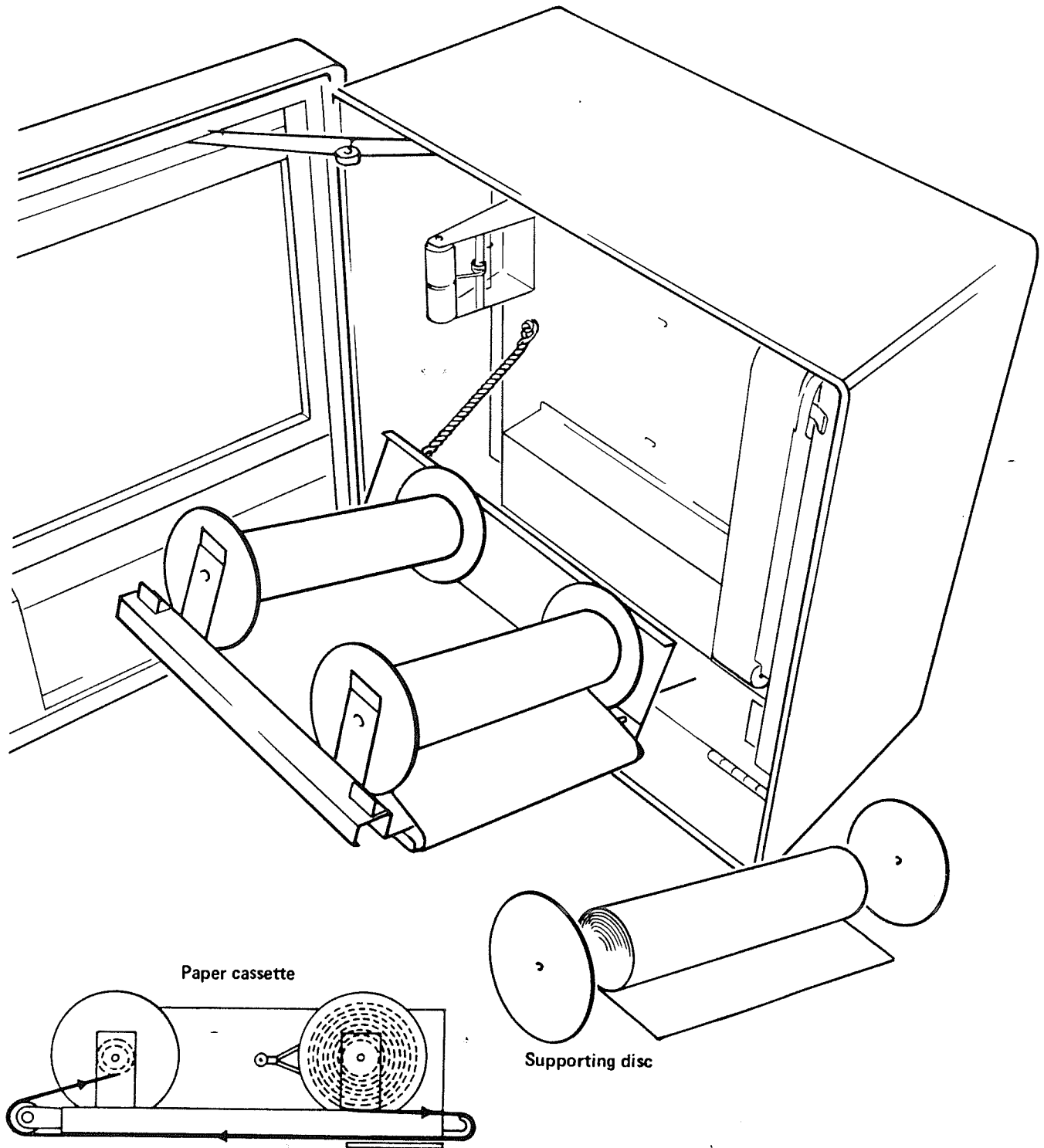
  
**9** Fuse holder  
 Fuses:  
 12 V - 4 A                      32 V - 1.5 A  
 24 V - 2 A                      220 V - 0.3 A

**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 **SKIPPER** 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

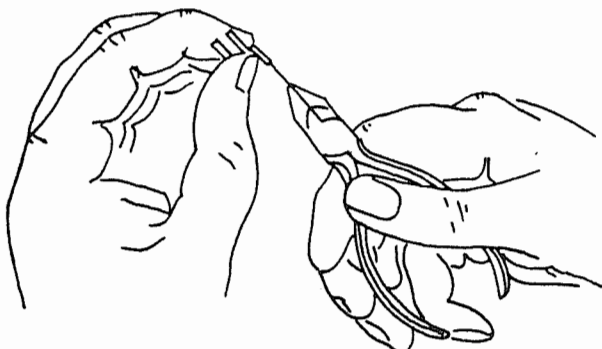
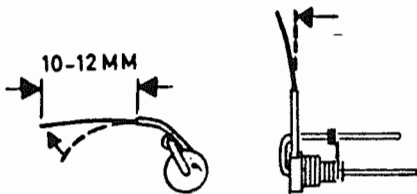
Normally no oiling and greasing is required. If necessary apply only one drop of oil on moving parts.

### 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:

- 8 ea fuses
- 5 ea scale lamps
- 2 ea recording pens
- 2 ea trailing contacts

Spare part Reg. No. 160-1

Replacing fuses.

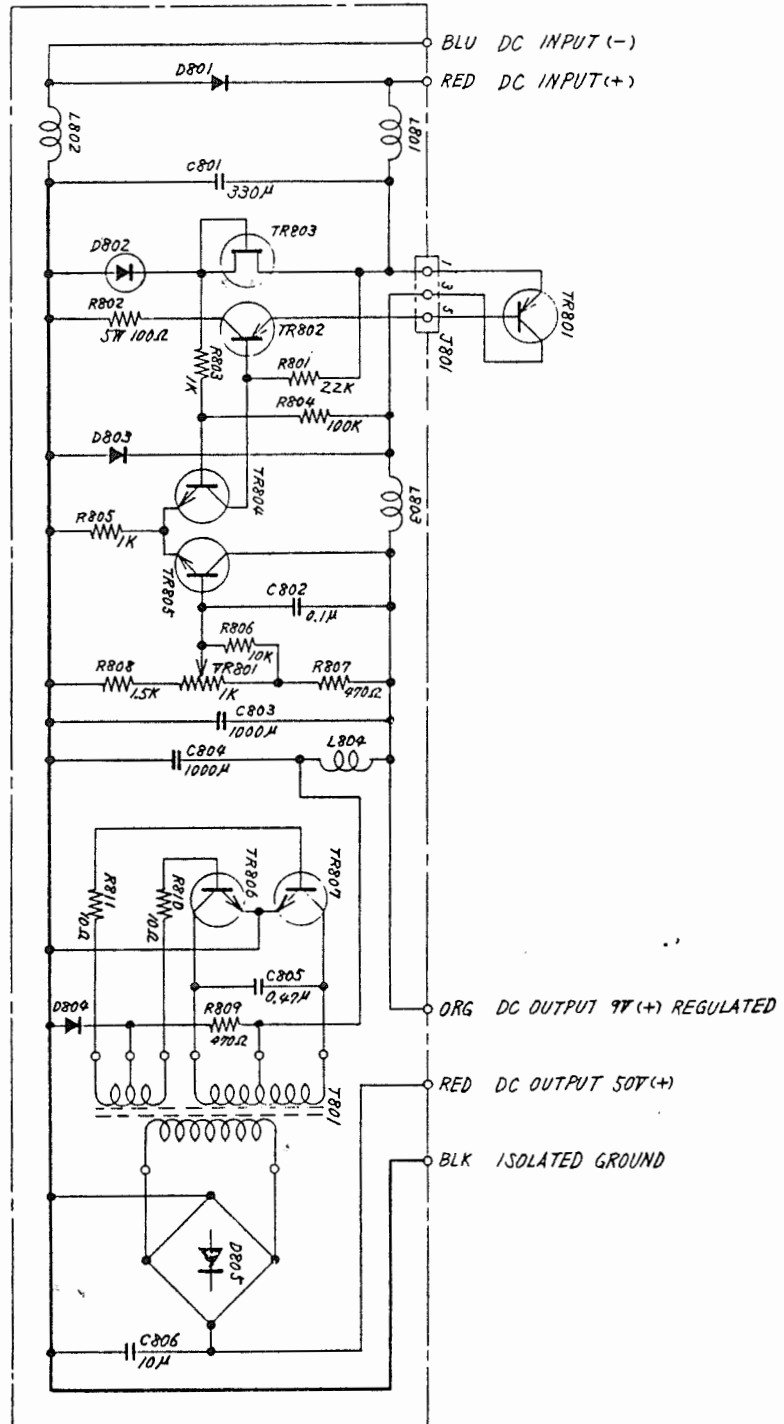
**SKIPPER ED 161** has one fuse which is located inside the cabinet. Switch off the echosounder before carrying out any replacement

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

### Replacing illumination lamps

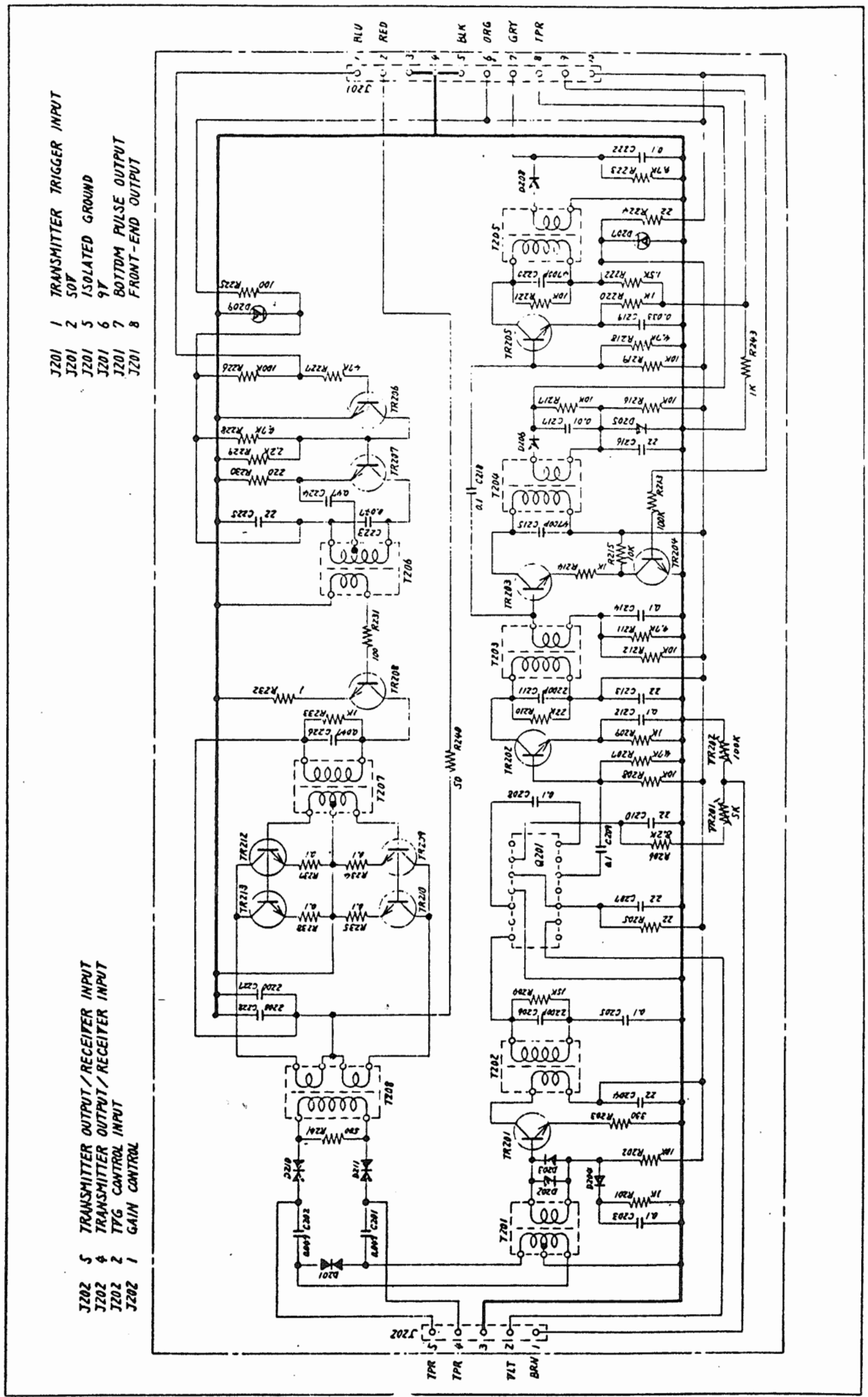
**SKIPPER ED 161** is furnished with 6 illumination lamps located inside the front door.

Switch off the echosounder before carrying out any replacement.

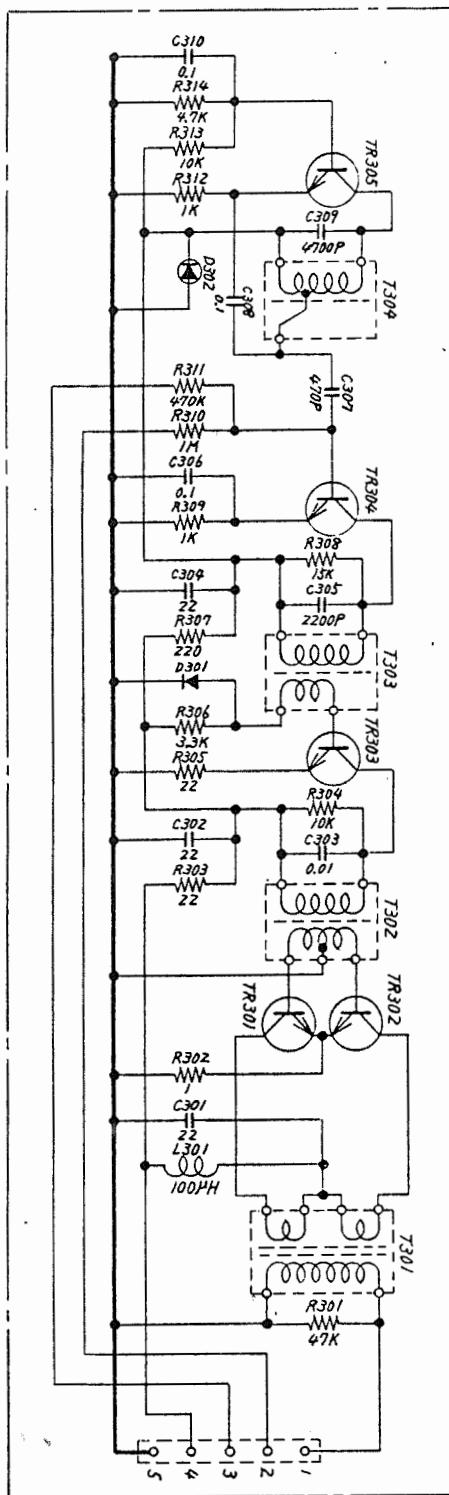


PB 161-127.  
 SKIPPER ED 161/162 POWER SUPPLY BOARD.



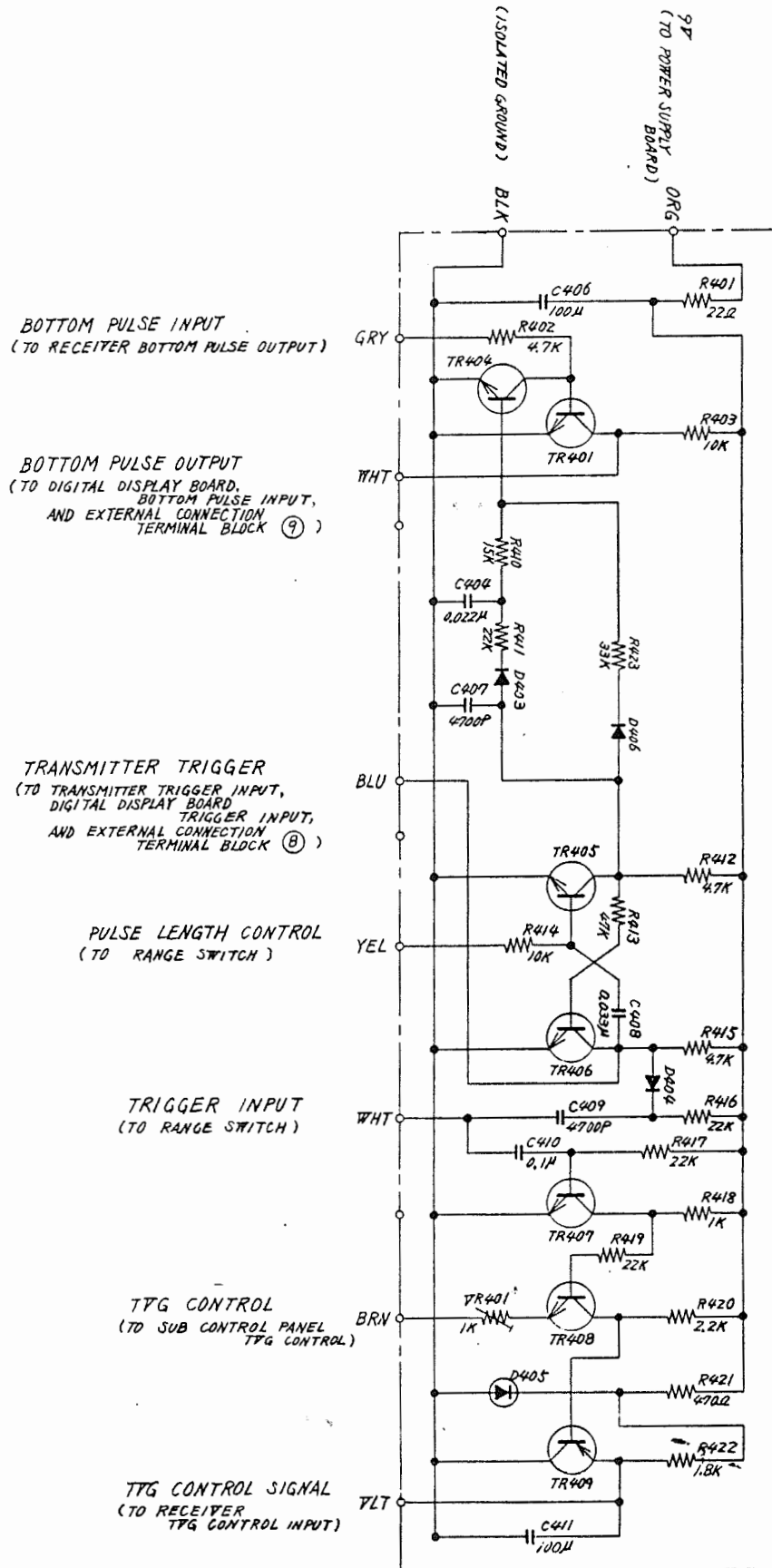


PB 161-108.  
 SKIPPER ED 161 TRANSMITTER & RECEIVER BOARD



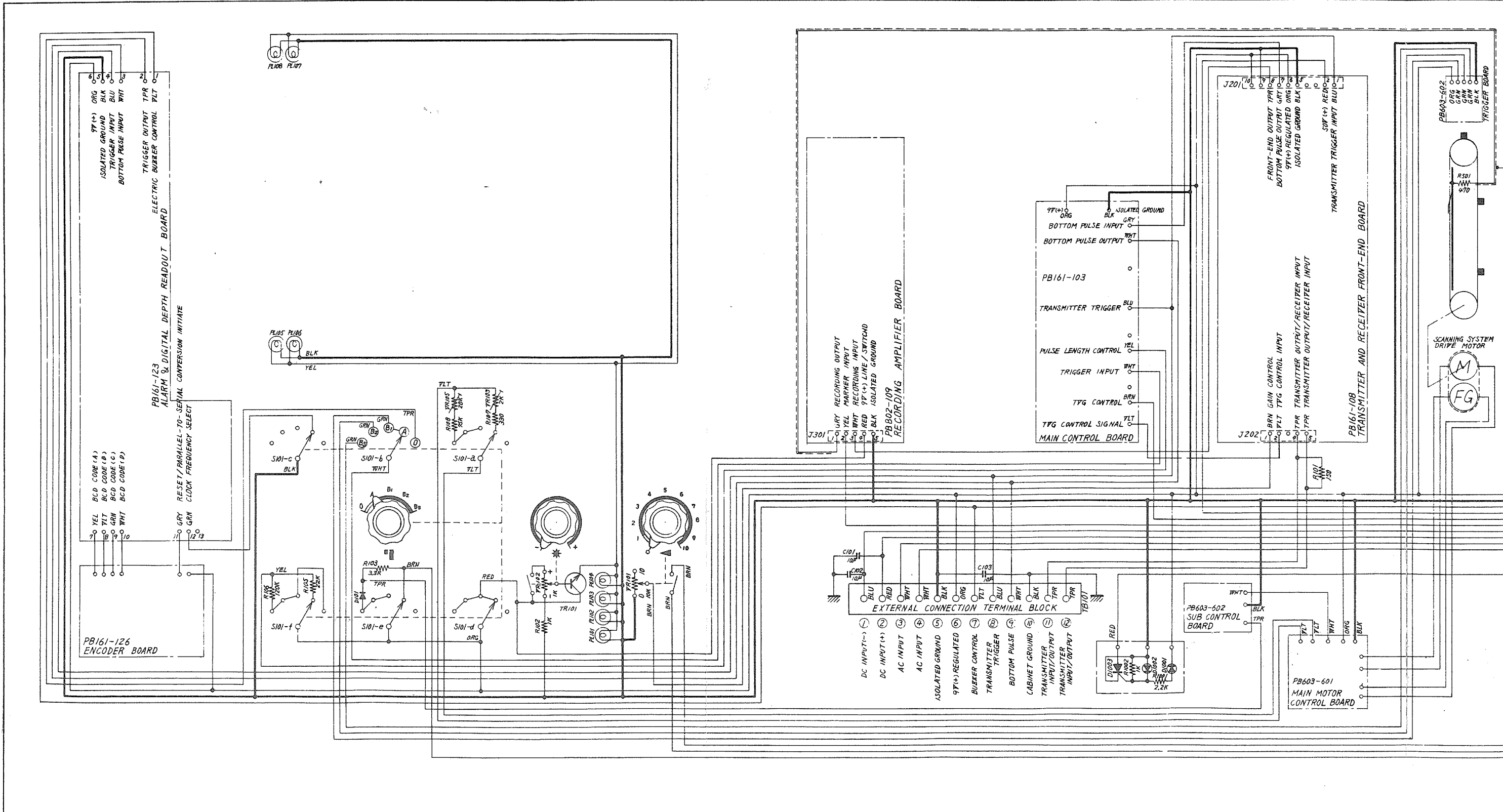
1 GRY RECORDING OUTPUT  
 2 YEL MARKER INPUT  
 3 WHT RECORDING INPUT  
 4 RED 9V LINE / SWITCHD  
 5 BLK ISOLATED GROUND

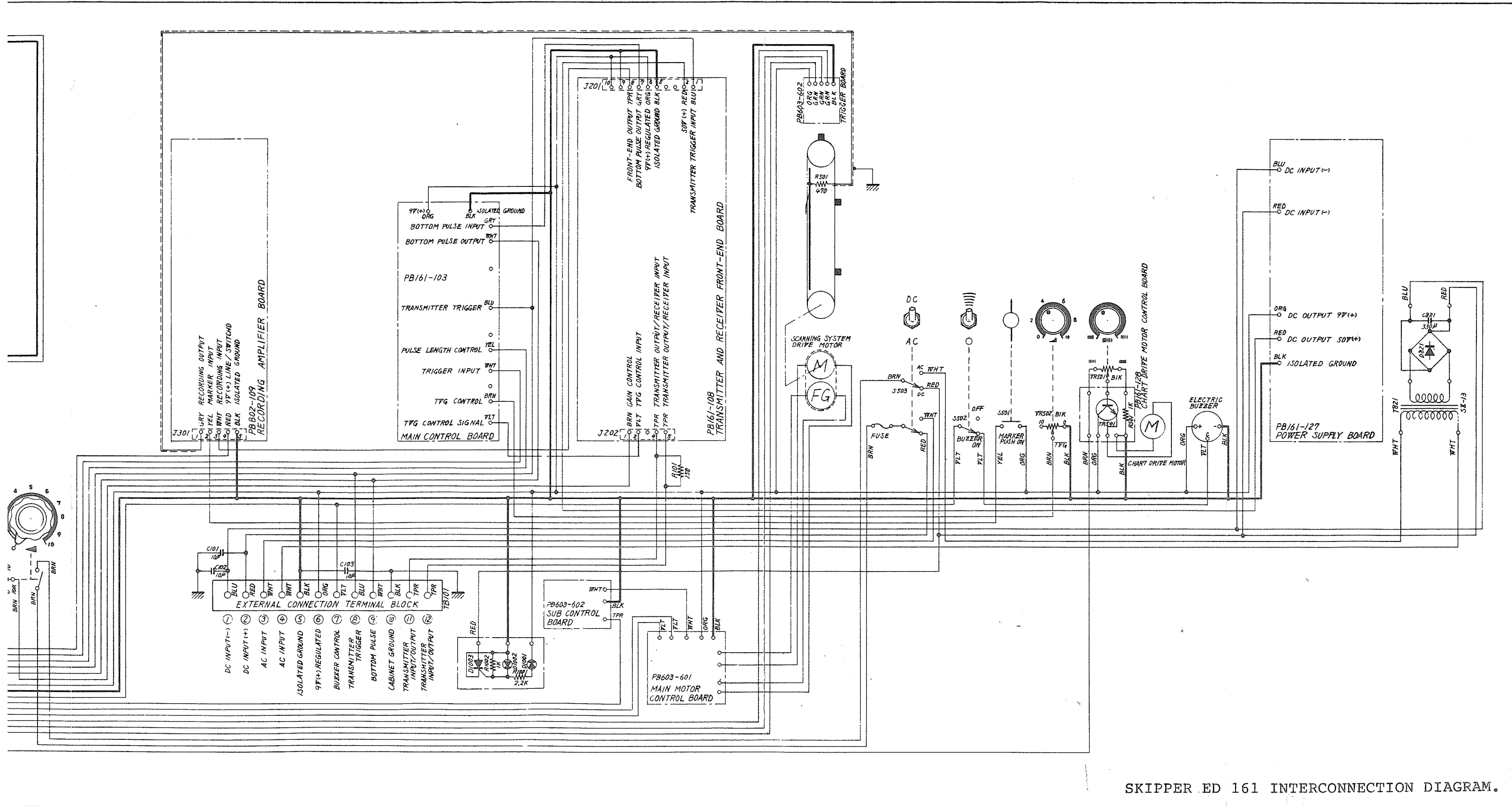
PB 802-109.  
 SKIPPER ED 161/162 RECORDING AMPLIFIER











SKIPPER ED 161 INTERCONNECTION DIAGRAM.