Ohaus Corporation
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Scout II

ELECTRONIC BALANCES

SERVICE MANUAL

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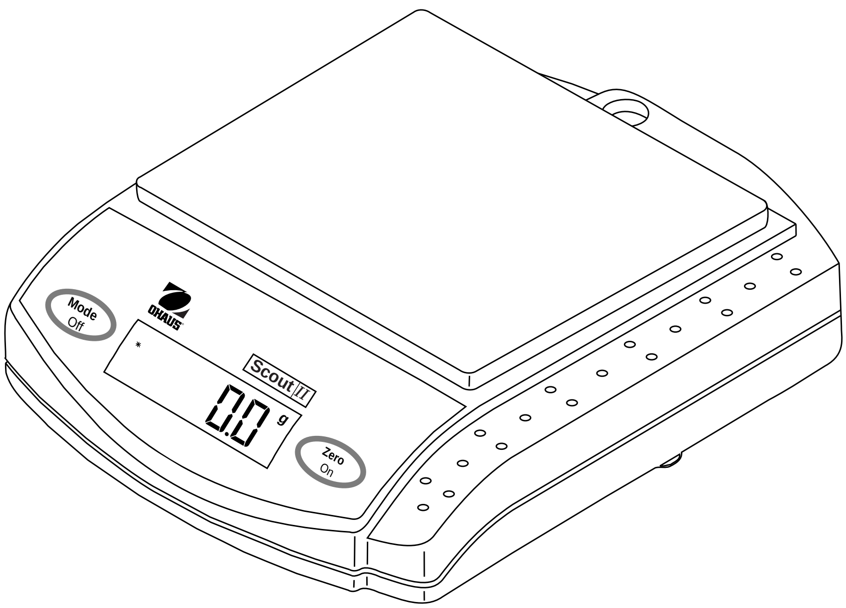

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1.1 INTRODUCTION

This service manual contains the information needed to perform routine maintenance and service on the Ohaus Scout II Electronic Balances, 200g, 400g, 600g, 1200g and 6000g capacities. The contents of this manual is contained in five chapters and are listed as follows:

Chapter 1 Introduction - Contains information regarding service facilities, tools and test equipment, measuring masses, and specifications.

Chapter 2 Theory of Operation - Contains information on the mechanical and electronic functions of the balance.

Chapter 3 Troubleshooting - Contains a diagnosis/diagnostics chart and error message table.

Chapter 4 Maintenance Procedures - Contains preventive maintenance procedures, performance tests and adjustments, disassembly/replacement procedures, adjustments and calibration procedures.

Chapter 5 Drawings and Parts Lists - Contains an exploded view of the balance identifying all components and schematics. Each item on the exploded view is numbered. These numbers appear in parenthesis throughout the manual after a particular part to aid in identifying its location which is shown on the exploded view drawing, Figure 5-1 in Chapter 5.

Before servicing the balance, you should be familiar with the Instruction Manual which is packed with every balance.

1.2 SERVICE FACILITIES

To service the Scout II Electronic Balances, the service area should meet the following requirements:

- Should be temperature controlled and meet the balance specifications for temperature environmental requirements. See specifications for temperature ranges of the various models.
- Must be free of vibrations such as fork lift trucks close by, large motors, etc.
- Must be free of air currents or drafts from air conditioning/heating ducts, open windows, people walking by, fans, etc.
- Area must be clean and air must not contain excessive dust particles.
- Work surface must be stable and level.
- Work surface must not be exposed to direct sunlight or radiating heat sources.

1.3 TOOLS AND TEST EQUIPMENT REQUIRED

In order to properly service the Scout II Electronic Balances, certain Ohaus special tools and test items are required in addition to standard electronic tool kits. These items are listed as follows:

1.3.1 Special Tools and Test Equipment List

1. Alternate voltage Power Adapter if local power requirements do not match Balance Adapter voltage ratings.

1.3.2 Standard Tools and Test Equipment List

1. Standard Electronics Tool Kit.
2. Digital Voltmeter (DVM) Input impedance of at least 10 megohms in the 1 Volt dc position.
3. Masses up to 2000 grams are required. Ohaus makes various calibration sets available. Please contact your nearest Ohaus dealer for further details.

1.4 TEST MASSES REQUIRED

The masses required to test the Scout II Electronic Balances must meet or exceed the requirements of ASTM Class 4 Tolerance. The calibration points are listed in Table 1-1.

TABLE 1-1. CALIBRATION POINTS

BALANCE CAPACITY	LINEARITY CALIBRATION CALIBRATION POINTS	SPAN CALIBRATION CALIBRATION POINT
200g	100g and 200g	200g
400g	200g and 400g	200g
600g	300g and 600g	300g
1200g	500g and 1000g	1000g
6000g	2000g and 4000g	4000g

NOTES:

1. A 200 gram mass is supplied with 200g and 400g Scout II balances.
2. A 300 gram mass is supplied with 600g Scout II balance.
3. Masses are not supplied with 1200g and 6000g balances.
4. Two 100 gram masses are required for linearity calibration on the 200g Scout II.
   Two 200 gram masses are required for linearity calibration on the 400g Scout II.
   Two 300 gram masses are required for linearity calibration on the 600g Scout II.
   Two 500 gram masses are required for linearity calibration on the 1200g Scout II.
   Two 2000 gram masses are required for linearity calibration on the 6000g Scout II.
5. A total of 300 grams is required for 200g Scout II down stop adjustment.
   A total of 600 grams is required for 400g Scout II down stop adjustment.
   A total of 900 grams is required for 600g Scout II down stop adjustment.
   A total of 1800 grams is required for 1200g Scout II down stop adjustment.
   A total of 9000 grams is required for 6000g Scout II down stop adjustment.

1.5 SPECIFICATIONS

Complete specifications for the Scout II Electronic Balances are listed in Table 1-2. When a balance has been serviced, it must meet the specifications listed in the table. Before servicing the balance, determine what specifications are not met.

TABLE 1-2.SPECIFICATIONS

Capacity (g)	200	400	600	1200	6000
Readability (g)	0.01	0.1	0.1	0.1	1
Repeatability (std. dev.) (g)	0.01	0.1	0.1	0.1	1
Linearity (g)	±0.01	±0.1	±0.1	±0.1	±1
Weighing modes	g, oz, ozt, dwt, parts counting			g, oz, lb,dwt,ozt, parts counting	
Tare range	To capacity by subtraction				
Over range capacity	103%				
Stabilization time (seconds)	3				
Sensitivity drift (%/°C)	±0.005	±0.02	±0.02	±0.009	±0.2
Zero point drift (g/°C)	±0.03	±0.5	±0.5	±0.2	±5
Operating temperature	50° to 104° F/10° to 40° C				
Operating humidity range	10% to 85% RH				
Power requirements	AC Adapter (supplied with balance) 100, 120, 220 or 240 V ac, 50/60 Hz or one 9 V battery (not included)				
Display (cm)	LCD (1.8 high)				
Pan size (W x D) (cm)	10.2 dia.	12.7x14.6			
Dimensions (W x H X D) (cm)	17.1 x 6.2 x 21				
Net weight (kg)	0.7	0.8			
Item No. without RS232	**SC2020**	**SC4010**	**SC6010**	**SCA210**	**SCF0A0**
Item No. with RS232	**SR2020**	**SR4010**	**SR6010**	**SRA210**	**SRF0A0**

2.1 BALANCE OPERATION

This chapter contains basic theory of operation of the balance. An exploded view drawing is included in Chapter 5 which identifies all mechanical components of the balance.

2.1.1 Operation

The AC Power Adapter cord plugs into a receptacle at the rear of the balance. The **Zero On** switch when pressed (located on the PC Board), applies power to the balance. When first turned ON, the balance displays a segment check for a few seconds. A tare function is performed after initialization so the balance displays zero and is ready for use. During any weighing operation, the user can tare the balance and weigh increments above and below the weight of the initial object.

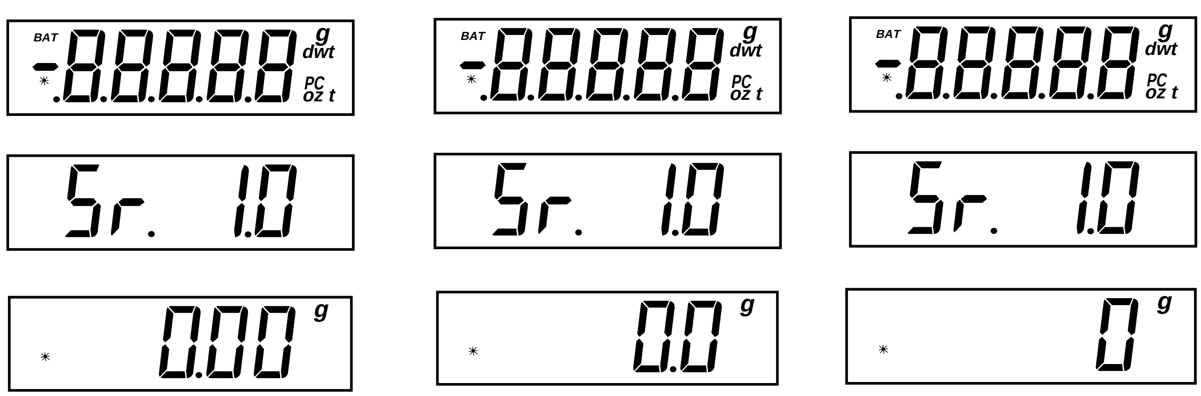
To aid the user, an error routine is employed to indicate that the weight input is beyond the limits of the balance. Various error displays indicate internal balance problems, overload conditions, incorrect calibration masses and parts counting errors.

2.1.1.1 Turning the Balance ON

With no load on the Platform, switch the balance ON by pressing **Zero On**. When first switched ON, all segments of the display should be on as shown in the illustration. Figure 2-1 illustrates the display sequence. This display check is displayed briefly followed by a software revision number (which may be different from the display shown below) and then the weighing mode.

Warm Up

Before initially using the balance, allow time for it to adjust to changes in environment. Turn the balance on to stabilize the electronics. Recommended warm up period is 5 minutes.



(200 g) (400, 600 &1200) (6000g)

Figure 2-1. Display Turn On Sequence.

2.2 TRANSDUCER OPERATION.

Figure 2-2 illustrates the Transducer assembly used in Scout II balances. For electrical components, refer to schematic diagram Figure 5-2, for mechanical components, refer to Figures 2-2 and 5-1. Two types of Transducers are used in the Scout balances, one type utilizes four Strain Gauges in a full bridge configuration, the second type contains two Strain Gauges in a half bridge configuration. The full bridge type has two Strain Gauges on top of the Transducer and two on the bottom. The half bridge type has two Strain Gauges located on the top of the Transducer and uses two 1K ohm resistors on the printed circuit board to complete the bridge.

The Transducer consists of an aluminum beam with 2 or 4 Strain Gauges bonded at the hinge areas. These 4 gauges are wired to form a Wheatstone bridge. When a load is placed on the Beam, it bends at the Flexures. The bending changes the resistance of the Strain Gauges and the resulting output from the Wheatstone bridge is proportional to the load. A Down Stop screw engages the Transducer Mounting Plate and limits the bending of the Beam, this prevents damage due to overloading.

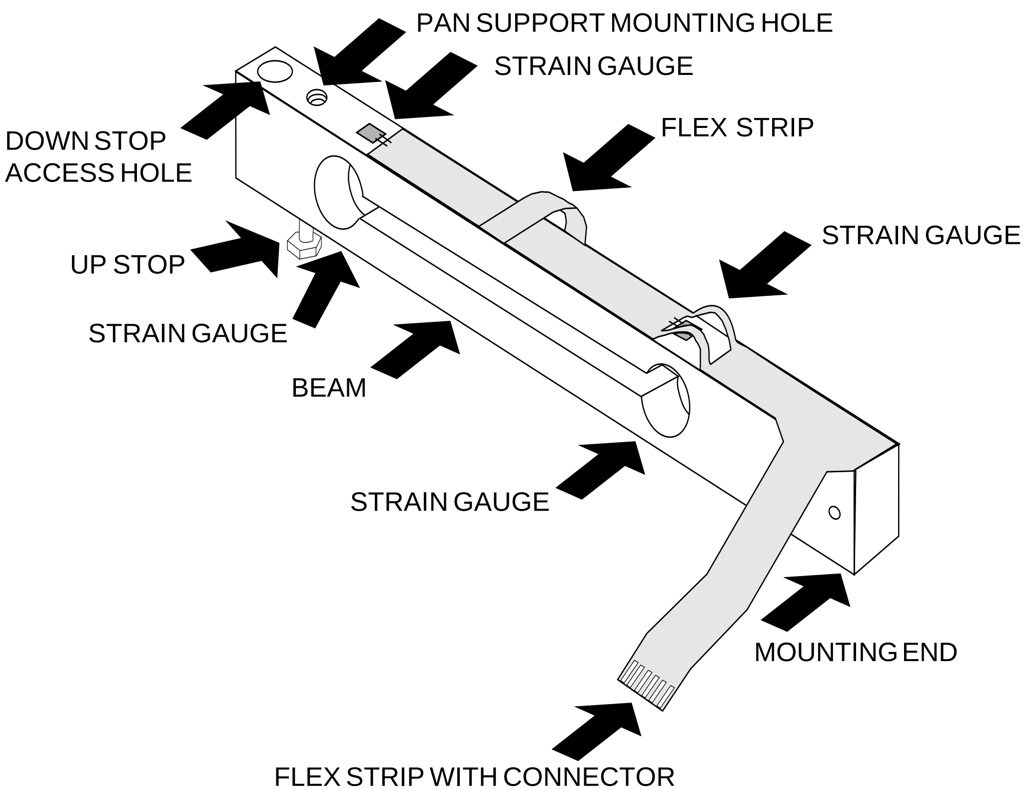


Figure 2-2. Strain Gauge Transducer.

2.3 PRINTED CIRCUIT BOARD DESCRIPTION

(See Block Diagram Figure 2-3 and Schematic Diagrams, Figure 5-2 and 5-3)

2.3.1 Power Supply

Power is supplied to the unit from either an AC Adapter which provides 9 volts dc or an internal 9 volt alkaline battery. External power enters through a jack J3 mounted at the rear of the balance. D9 is a protection diode which prevents an incorrect polarity voltage from damaging the balance. Capacitor C18 is a filter which is used to filter the raw dc voltage coming from the external power supply or battery. Capacitor C8, Ferrite Chokes L1 and L2 provide high frequency (HF) noise and transient suppression. The power input jack J3 has a contact which disconnects the internal 9 volt battery line when the AC Adapter is connected to the balance. The Printed Circuit Board contains one voltage regulator VR1 which provides regulated +5 volts dc to operate the balance. Filtering of the +5 volts dc is accomplished by capacitors C14 and C9. Transistor Q6, which is in series with voltage regulator VR1, applies dc power to the regulator and is part of the ON/OFF circuit function which is described in paragraph 2.3.2.

2.3.2 ON/OFF Circuitry

2.3.2.1 Turn On Circuitry

The **Zero On** switch SW1 performs two functions, one is to turn the balance on and the second is to tare, (or rezero) the balance. When the balance is properly connected to a power source and in the off state, pressing the **Zero On** switch SW1 applies a ground signal through one end of diode D6 and R22 and to the base of transistor Q6 turning it on. When microprocessor U1 initially receives power, an “on_hold” signal is generated at pin 28 of the microprocessor and is passed through resistor R20 to the base of transistor Q5. This turns on Q5 and acts as a latch and keeps transistor Q6 turned on even after switch SW1 is released. With transistor Q6 turned on, VR1 is operational and provides a regulated +5 volts dc to the rest of the circuitry. When the balance is powered on pressing the **Zero On** switch SW1 sends a ground signal though the other end of diode D6 to microprocessor U1 on pin 9. This signal causes the microprocessor to tare, (rezero) the balance.

2.3.2.2 Turn Off Circuitry

Pressing and holding the **Mode Off** switch SW2 for an extended time turns the balance off by applying +5 volts dc to microprocessor U1, pin 10. When this occurs, the display will indicate OFF, a low signal is then generated by the microprocessor U1 pin 28 to resistor R20 turning off transistors Q5 and Q6.

In the event that the microprocessor locks up, pressing and holding the **Mode Off** switch SW2 for five seconds or more applies +5 volts dc to resistors R37 and R39 charging capacitor C16 and turning on transistor Q1. With transistor Q1 on, transistor Q5 is forced off and transistor Q6 turns off thus removing dc power from voltage regulator VR1 and all dc power from the balance.

2.3.3 Low Voltage Detector

The purpose of the Low Voltage Detector circuitry is to inform an operator when the battery voltage drops to a level which may cause improper operation of the balance and requires replacement of the battery. Transistors Q4 and Q7 form the low voltage detector. Transistor Q7 is turned on as long as the voltage across VR1 pins 1 and 3 is greater than the emitter-base turn on voltage of Q4, (approx. 0.6 V). With a low battery voltage, Q4 turns off, turning off Q7. The result is that the VLOW signal at the collector of Q7 goes high placing a high state at pin 9 of microprocessor U1. The microprocessor U1 then sends a corresponding signal to driver LCD U7 which causes "BAT" to be displayed on the LCD display DS1.

2.3.4 Temperature A/D Converter

The primary function of the Temperature A/D Converter is to convert an analog signal developed by a temperature sensor located on the Transducer into a digital signal. This signal is proportional to the temperature and can be read by the microprocessor U1. This allows the balance to automatically compensate for temperature changes and maintain a more accurate weight reading. The dc current shunted by the temperature sensor is connected via R9 to the summing junction of an integrator circuit at U8 pin 2. This current is combined with other currents coming from both R12 and R11 into the summing junction. The current from R12 provides a fixed offset. The current from R11 is a switched signal from U4E and U4F which act as electronic analog switches.

The switched signal originates from microprocessor U1 pin 27 and has a duty cycle that can vary between 10 and 30%. The duty cycle of the switched signal adjusts the total current into the summing junction by either supplying or removing a known quantity of current over time. A reference voltage developed by voltage divider R4 and R5 is applied to pin 6 of U3B which is a comparator and to pin 3 of U8 which is the integrator. The output of the integrator U8 pin 6 develops a sawtooth signal which is compared with the reference voltage by comparator U3B. When the sawtooth signal is on the down slope and crosses the reference voltage the comparator U3B outputs a low signal to the microprocessor U1 pin 41 through resistor R43. When this low signal is detected the microprocessor changes the polarity of the switched signal going to U4E and U4F. This reverses the switching action into the integrator and starts a new cycle. The microprocessor interprets the duty cycle of this signal as being proportional to the amount of current which is being shunted by the temperature sensor and thus the temperature at the Transducer. Additional RC components are used in this circuit to help filter HF noise which may be present.

2.3.5 Full Bridge Weight A/D Converter

The primary function of the Full Bridge Weight A/D Converter is to convert the analog voltages developed by a full bridge Transducer into a digital signal which is proportional to the analog voltages. This signal is then processed by microprocessor U1 to determine the weight on the Transducer. The circuitry consists of integrator U5, comparator U3A, electronic switches U4A, U4B, U4C, and U4D with resistors R1, R2, R3, R7, R14, R34, R35, capacitors C1, C12, and transistor Q2.

2.3.5 Full Bridge Weight A/D Converter (Cont.)

The circuitry functions in a similar manner as the Temperature A/D Converter except a duty cycle of 10 to 90% is achieved. One output of a Full bridge Transducer is through resistor R13 into the summing junction of integrator U5 at pin 2. The other end of the Transducer bridge is connected through R24 to pin 3 of U5 and serves as a reference point for the integrator circuit. The output of U5 is a sawtooth signal which is connected to U3A pin 2. Instead of comparing the sawtooth against a fixed reference voltage this circuit compares it against a ramp signal generated by transistor Q2, resistors R2, R3 and capacitor C12. At time zero, capacitor C12 starts to charge through series resistors R2 and R3. The output of the ramp circuit on pin 3 of U3A starts high and goes low. The output of integrator U5 pin 6 starts low and goes high.

When the ramp signal at pin 3 of U3A crosses the sawtooth signal from integrator on pin 2 of U3A, the comparator output on pin 1 changes from high to low. This signal is input to the microprocessor at pin 42. The microprocessor pin 25 then reverses the polarity of the switching signal to the electronic switches U4A, U4B, U4C and U4D and also turns on Q2. The switched signal resets the integrator sawtooth to low by reversing the current flow into the integrator's summing junction.

With Q2 turned on, capacitor C12 is discharged and the ramp is reset to high. The cycle then repeats. The duty cycle of the switched signal, (less the duty cycle amount from the original zero weight position) is proportional to the added weight on the Transducer. Additional RC components are used in this circuit to help filter HF noise which may be present.

2.3.6 Half Bridge Emulator

The primary function of the Half Bridge Emulator is to simulate a full bridge circuit by using a pair of precision 1K resistors, (in RP2) to form the other half of the bridge. Half bridge models use a Transducer with only two Strain Gauges and one active output signal. All other circuit functions of the Full Bridge Weight A/D Converter apply. (Note: There are a number of component value differences and some non-installed components on Half Bridge PCB's as compared to the Full Bridge type. These component differences are shown in a chart at the bottom of the Main Board schematic drawing.)

2.3.7 Microprocessor U1

Microprocessor U1 processes the A/D converter signals, controls electronic analog switches U4, reads calibration and setup data from EEPROM U6 and sends display information to the LCD display driver U7. Microprocessor U1 also monitors the low battery signal and provides an output to the display driver for a low battery indication on the display if needed. Power on Reset circuitry for the microprocessor consists of resistor R17, capacitor C6 and diode D5.

2.3.8 EEPROM U6, (U6A)

Integrated circuit U6 is an EEPROM which stores the necessary calibration and setup data for the balance. This data is read by microprocessor U1 when needed. Data is stored during manufacture of the balance and during subsequent user calibrations and setups. The stored data also includes the options and parameters selected by the user from the Menu function of the balance.

2.3.9 Display Driver U7

The Display Driver U7 converts the serial display information from microprocessor U1 to the individual signals which drive the individual segments of the LCD display DS1. Resistors R25 and R26 determine the contrast of the display and the viewing angle.

2.3.10 RS232 Board, (Only on certain models)

The RS232 interface is available only on certain models and is not a user installable option. The RS232 interface allows connection of the balance to a printer or PC system for recording of data and external control of the balance.

The interface is a separate PCB that mounts at the rear of the balance. A standard 9 pin RS232 connector, (J2) extends through the rear housing of the balance. A flat ribbon cable connects J1 of the interface board to J2 of the main board. (Scout II models that do not include the interface option do not have J2 installed on the Main board.) The setup menu for the interface is only available when the RS232 board is detected by the Main board's circuitry. On the interface board J1 pin 7 is connected to ground and supplies a low signal back to the Main board that allows the presence of the RS232 board to be detected.

U1 of the interface board provides signal line buffering and level conversion for the RS232 signals. TTL signals from the microprocessor on the main board are level converted by U1 and sent to J2. RS232 signals received at J2 are converted to TTL levels and sent to the microprocessor. Capacitor C2, C3, C5 and C6 are used for the charge/pump and filtering functions of U1's bipolar voltage generators. Capacitors C1 and C4 provide power supply filtering to the interface board and reduce noise feedback to the Main board circuitry.

The pin out of the 9 pin RS232 connector J2 is not fully compatible with RS232-C standards. A specially wired cable is required to connect the balance to a standard RS232 printer or to a PC system. Some pins on J2 perform additional functions other then RS232 serial communications. J2 pin 4 allows an external momentary switch, (connected to ground, J2 pin 7) to ReZero the balance. In a similar fashion J2 pin 9 allows an external momentary switch to initiate a print function. Special RS232 data cables are available as optional equipment from your Ohaus dealer. When not being used the RS232 board can be disabled by a low signal on J1 pin 8. Disabling the RS232 board will extend battery life if the AC Power Adapter is not being used. The initial default mode of the RS232 interface is off. The interface is enabled by using the "Print-PoWr-On" selection of the user menu.

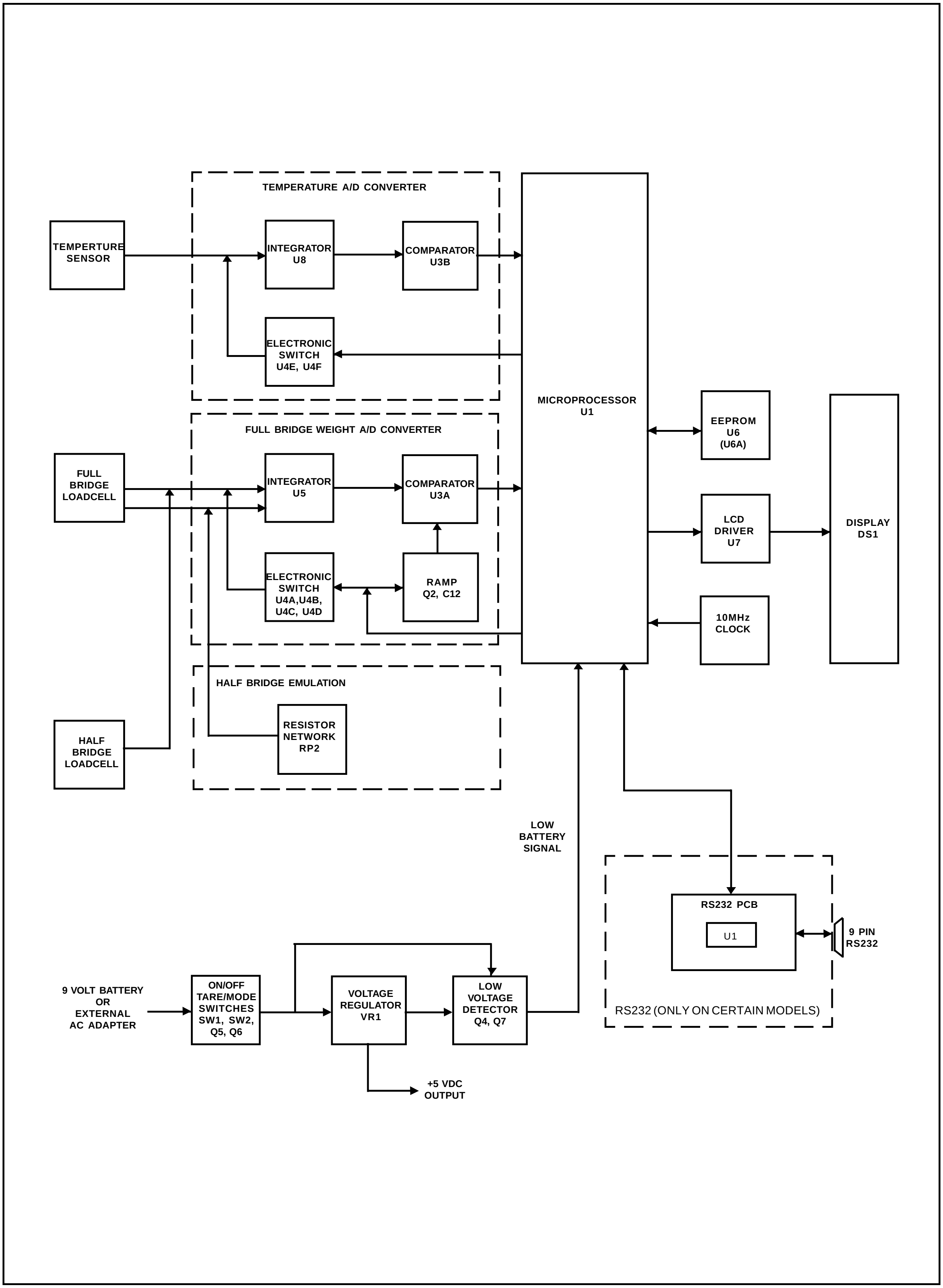


Figure 2-3. Block Diagram.

3.1 TROUBLESHOOTING

This section of the manual specifies problem areas of the balance which can occur. Information is contained to isolate specific problems using Table 3-1, Diagnostic Guide, and Table 3-2, Error Codes. Follow all directions step by step. Make certain that the work area is clean and use care when handling components of the balance.

3.2 DIAGNOSTIC GUIDE

Table 3-1 is a diagnostic guide designed to help locate the problem area quickly and easily. To use the table, first locate the symptom that you are observing. Follow the symptom column and review the probable cause column and remedy column. The probable causes are listed with the most common cause first. If the first remedy does not fix the problem, proceed on to the next remedy. Before attempting to repair the Balance, read all chapters of this manual to familiarize yourself with the balance components and operation. Do not attempt repairs unless you fully understand the operation of the balance.

3.2.1 Diagnosis

1. Isolate and identify the symptom.

2. Refer to Table 3-1 Diagnostic guide and locate the symptom.

3. Follow the suggested remedies in the order that they appear.

4. Perform the indicated checks, or see the appropriate section of the manual.

5. Repair or replace the defective section of the balance.

NOTE:

If more than one symptom is observed, it is necessary to approach one area at a time, and also remember, that the symptoms may be interrelated.

In the event that erratic or fluctuating weight readings are observed, it is necessary to isolate the problem to either the mechanical area or the electronic area of the balance. The repeatability test will quickly point out whether the Transducer (8) is operating properly or whether the problem is due to an electronic malfunction.

If a problem arises that is not covered in this manual, contact Ohaus Corporation for further information.

TABLE 3-1. DIAGNOSTIC GUIDE

SYMPTOM	PROBABLE CAUSE	REMEDY
No display.	1. No power. 2. Power Jack defective. 3. Weak battery. 4. Battery connector - poor contact. 5. PC Board defective.	1. Check AC Adapter. 2. Replace Power Jack. 3. Replace. 4. Clean or replace. 5. Replace PC Board.
Low BAT displayed.	1. Weak battery. 2. AC Adapter defective or wrong type being used. 3. PC Board defective.	1. Replace battery. 2. Replace AC Adapter. 3. Replace PC Board.
Stays in segment check.	1. Weak battery. 2. PC Board defective.	1. Replace battery. 2. Replace PC Board.
Always displays zero.	1. Possible power surge. 2. Down stop improperly set. 3. Transducer not connected. 4. Defective Transducer. 5. PC Board defective.	1. Perform linearity and span calibration. 2. Set per specifications. 3. Plug in Transducer. 4. Replace Transducer. 5. Replace PC Board.
Cannot calibrate.	1. Incorrect calibration masses. 2. Transducer not connected. 3. Defective Transducer. 4. PC Board defective.	1. Use correct masses. 2. Plug in Transducer. 3. ReplaceTransducer. 4. Replace PC Board.
Displays (Err1) underweight/overweight.	1. Improper calibration (Span or Linearity). 2. Defective Transducer. 3. PC board defective.	1. Perform calibration procedure. 2. Replace Transducer. 3. Replace PC Board.

TABLE 3-1. DIAGNOSTIC GUIDE (Cont.)

SYMPTOM	PROBABLE CAUSE	REMEDY
Displays (Err1) under-weight/overweight (Cont.).	4. Down Stop improperly set.	4. Set per specifications.
	5. Missing Pan.	5. Install Pan.
Exceeds off center limit.	1. Defective Transducer.	1. Replace Transducer.
Inaccurate readings.	1. Improper calibration (Span or Linearity).	1. Perform calibration procedure.
	2. Not zeroed before weighing.	2. Press Zero On with no weight on the Pan, then weigh.
	3. Defective Transducer.	3. Replace Transducer.
	4. PC Board defective.	4. Replace PC Board.
Fluctuating readings.	1. Unstable environment.	1. Check area for vibrations, leveling and drafts.
	2. Debris in balance.	2. Disassemble and clean if necessary.
	3. PC Board defective.	3. Replace PC Board.
	4. Defective transducer.	4. Replace Transducer.
Drifting display.	1. Balance not warmed up.	1. Allow balance to stabilize.
	2. Defective Transducer.	2. Replace Transducer.
	3. PC Board defective.	3. Replace PC Board.
Error code (Err#) on display.	1. Balance has detected an error condition.	1. See Table 3-2, Error Codes.
	2. Defective Transducer.	2. Replace Transducer.
	3. PC Board defective.	3. Replace PC Board.
RS232 Not functioning. (On models equipped with RS232).	1. Improper Print Menu settings.	1. Check all settings. (Menu item ***Power*** must be set to ***ON***.)
	2. RS232 cabling defective or wrong type used.	2. Check data cable.
	3. Loose or disconnected ribbon cable between RS232 PC Board and Main PC Board.	3. Check ribbon cable.
	4. RS232 board defective.	4. Replace RS232 board.

3.3 ERROR CODES

Scout balances are equipped with software which will display an error condition when it occurs. Table 3-2 Error Codes, describes the various error codes which can appear on the display and specifies the probable reason and remedy.

TABLE 3-2. ERROR CODES

DISPLAY	REASON
Err 0	Invalid memory checksum data. The balance may need recalibration, particularly linearity calibration. If the error persists after recalibration, return the balance to the factory for servicing.
Err 1	An overload or underload condition exists. If an error occurs when the sample is within the balance's capacity, balance may be incorrectly calibrated. An underload such as the pan off of the balance could also display Err1. Recalibrate the balance.
Err 4	Incorrect or no calibration mass used when performing calibration procedure. Error will flash momentarily, then the balance will use previous calibration data. Recalibrate correctly.
Err 5	Value is too large to display; exceeds 99999 counts. Possibly caused by an invalid parts counting sample.
Err 6	Parts counting error - sample weighs <1d. Balance shows error then exits parts counting.
Err 8	RS232 buffer full.
Err 9	Internal data error. Return the balance to the factory for servicing.

4.1 PREVENTIVE MAINTENANCE

Ohaus Scout II balances are precision instruments and should be handled as follows:

- Store in a clean dry area which is dust free. Use a cover if possible.
- Keep clean at all times.
- Do not leave a mass or any type of weight on the balance pan when the balance is not in use.
- Remove the battery if the balance is not to be used for a long period of time.
- Do not operate balance in an area with air drafts or vibration.

All Ohaus balances are constructed of durable materials. However, it is recommended that when a balance has had chemicals or liquids spilled on it, the balance should be cleaned as soon as possible. Use warm water on a damp cloth to clean all exterior surfaces. When moving the balance from a storage area which is at a different temperature than the area where the balance is to be operated, allow sufficient time for the balance mechanism to temperature stabilize. This time can vary depending upon the temperature differences. Also, after turning the balance ON, allow 5 minutes after temperature stabilization for the balance electronics to stabilize.

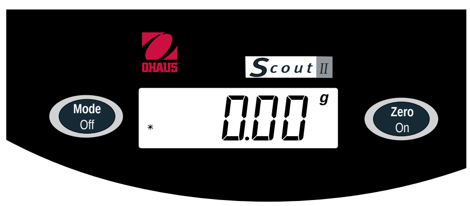


Figure 4-1. Front Panel Controls.

4.1.1 Preventive Maintenance Checklist

Every six months, the balance should be inspected and checked as follows:

1. Remove power from the balance, then remove the Pan (6).

2. Remove the Pan Support Retaining Screw (B) (see Figure 4-2). Remove the Pan Support (5) and inspect and clean the area beneath the Pan Support (5).

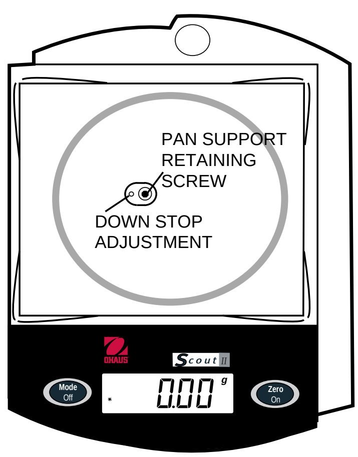


Figure 4-2. Pan Support Retaining Screw (B) Location.

4.1.1 Preventive Maintenance Checklist (Cont.)

3. Clean the outside of the balance using a damp cloth with water.

CAUTION

DO NOT USE CHEMICAL CLEANERS OR SOLVENTS OF ANY TYPE. SOME CLEANERS ARE ABRASIVE AND MAY AFFECT THE FINISH OF THE BALANCE.

4. Check the AC Adapter for broken or damaged insulation.

5. Make a visual inspection for faulty connectors, and loose hardware.

4.2 TESTING

Before servicing the balance, an operational test and various performance tests should be made to ascertain whether or not the balance meets specifications. Turn the balance on and allow it warm up for at least five minutes before performing these tests. Make sure the test area is free from drafts and that the balance rests on a level and vibration free surface. The masses used for the performance tests and adjustments must be adjusted to ASTM Class 4 tolerance or better.

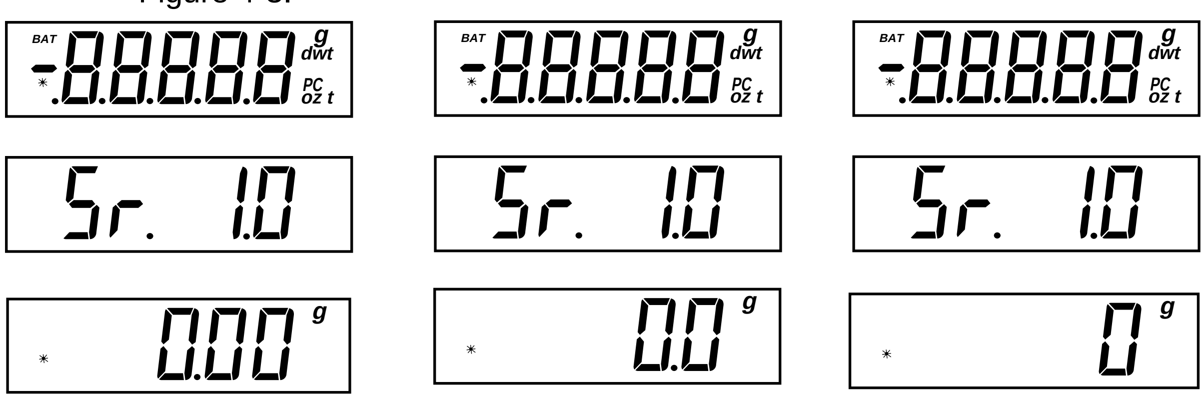
4.2.1 Operational Test

1. Connect a functioning AC Adapter to the balance Power Jack (16) located at the rear of the balance.

2. Plug the AC Adapter into a suitable power source. If the AC Adapter supplied with the balance is rated for a different voltage, use an appropriate adapter to match the supply voltage.

4.2.1.1 Segment Display Test

1. Turn the balance on by pressing **Zero On**, all segments are enabled and displayed briefly, then followed by a software revision number (which may be different from the display shown below). This is a segment display test. See Figure 4-3.



(200 g) (400, 600 &1200) (6000 g)

Figure 4-3. Display Turn On Sequence.

4.2.1.1 Segment Display Test (Cont.)

2. Tare the balance. The display should indicate a zero weight.

4.2.2 Calibration

To verify that the balance is functioning properly, it must be calibrated prior to testing. After calibration, proceed to Performance Tests, paragraph 4.2.3.

Span Calibration resets the balance's weighing range by checking 2 points: zero and a weight value within the balance's range.

Linearity Calibration resets the balance's weighing range by checking 3 points; zero and two different weight values within the balance's range. This also helps minimize deviations between actual and displayed weights throughout the range.

A 200 g calibration mass is supplied with the 200g and 400g balances for performing Span Calibration. A 300 g calibration mass is supplied with the 600g balance. Linearity calibration requires an additional 100g mass for 200g Balances, 200g mass for 400g balances and 300g mass for 600g balances. Calibration masses are not supplied with 1200g and 6000g balances. Masses are available from Ohaus as accessories.

4.2.2.1 Calibration Masses

Before beginning calibration, make sure masses are on hand. Do not rely on previously stored calibration data. Calibration should be performed as necessary to ensure accurate weighing. Masses required to perform calibration is listed are Table 4-1.

TABLE 4-1. CALIBRATION MASSES

MODEL	LINEARITY MASS	SPAN MASS
200g	2 x 100g	200g
400g	2 x 200g	200g
600g	2 x 300g	300g
1200g	2 x 500g	1000g
6000g	2 x 2000g	4000g

NOTE: Masses must meet or exceed ASTM Class 4 Tolerance. Calibration masses are available from Ohaus as accessories.

4.2.2.2 Calibration Procedure

Before beginning the procedure, make sure that the calibration masses are on hand.

NOTE: When performing a calibration, do not remove calibration mass until a weight value or next calibration request is displayed on the balance.

4.2.2.2 Calibration Procedure (Cont.)

Span Calibration

Scout II balances are calibrated before shipment, however, calibration can be affected by changes in location, temperature, or rough handling. The balance should be warmed up for at least 5 minutes.

1. Press and hold **Zero On** until ***CAL*** is displayed then release it. ***-C-*** is momentarily displayed followed by the value of the mass which must be placed on the center of the Pan (6). **Do not disturb the balance when *-C-* is displayed.**

2. Place required mass on the ***center*** of the Pan (6) and momentarily press **Zero On**.

3. When the weight on the Pan (6) is displayed with the stability indicator *, the balance is calibrated.

Linearity Calibration

1. With the balance OFF, press **Zero On** until ***MENU*** is displayed.

2. Repeately press **Mode Off** until ***Lin*** is displayed, then press **Zero On.** ***-C-*** is momentarily displayed followed by the value of the mass which must be placed on the pan.

   Do not disturb the balance while *-C-* is displayed.

3. Place the displayed value of the first mass on the pan and momentarily press **Zero On**. ***-C-*** is displayed, then the value of the second mass to be placed on the pan is displayed.

4. Place the displayed value of the second mass on the pan and momentarily press **Zero On.**

5. When the weight on the pan is displayed with the stability indicator *, the balance is calibrated. Remove the mass from the pan.

When Linearity calibration is completed, the balance automatically exits the menu and stores any changes you have made.

4.2.3 Menu System

The Menu System permits you to verify and change balance parameters. Balance parmeters include: Auto Shut-off, enable/disable available weighing units, parts counting, print parameters, and perform Linearity calibration. The Menu System is navigated by using the two front panel buttons. Pressing the same button repeatedly loops through a list of menu items or parameters. Switching to the other button changes the menu flow or changes the parameter being viewed.

1. To enter the menu, start with the balance off, press and hold **Zero On** until ***MENU*** is displayed, then release **Zero On**. The first menu item ***A OFF*** is displayed.

2. Repeatedly press **Mode Off** to display the desired menu item to be used or to exit, press **Mode Off** until ***End*** is displayed, then press **Zero On**.

   NOTE: To save changes to the menu Sysytem, the menu item ***End*** must be selected and ***Zero On*** pressed. Exiting the Menu System in any other way does not save changes.

MENU
- A.OFF - Set to On or **Off**.
- UNITS*- **g**, **oz**, **lb**, ozt, dwt, pc - set each On or Off.
- PRINT** - Power - On or **Off**.
  - Baud Rate - 300, 1200, **2400**, 4800, 9600
  - Data Bits - **7** or 8
  - Parity Bit - Odd, Even or **None**
  - Stop Bits - 1 or **2**
  - Auto Print - Continuous, On Stability, or **Off**
  - Print Stable Data Only - On or **Off**
  - End.- Exit menu and store settings.
- LIN- Perform linearity calibration.
- END- Exit menu and store settings.

*Available weighing units may vary with model.
** RS232 models only.

NOTE: Bolded text in the menu are default settings.

4.2.3.1 Auto Shutoff Activation

When Auto Shut-off is activated, the balance shuts off after three minutes of non use. To activate auto shut-off, proceed as follows:

1. Start with the balance OFF. Press **Zero On** until ***MENU*** is displayed. When **Zero On** is released, ***A. OFF*** is displayed.

2. With ***A. OFF*** displayed, press **Zero On** to view current state (ON or OFF).

3. Press **Mode Off** to change the displayed setting to either ***On*** or ***OFF***.

4.2.3.1 Auto Shutoff Activation (Cont.)

4. To accept the displayed setting, press **Zero On.** The display returns to ***A. OFF***.

5. Press **Mode Off** until ***End*** is displayed, then press **Zero On** to store and save setting. Balance is now in a weighing mode.

4.2.3.2 Activating Units and Parts Counting

1. When the balance displays ***UnitS***, press **Zero On** to display the grams indicator "g" with its current setting ***On*** *g* or ***OFF*** *g*.

2. To change the displayed setting, press **Mode Off**.

3. To accept the displayed setting, press **Zero On**. The display advances to the next weighing unit.

4. Repeat steps 2 and 3 for each weighing unit and parts counting ***PC***. When the last unit has been accepted, the display indicates ***UnitS***.

5. Repeately press **Mode Off** until ***End*** is displayed, then press **Zero On** to store and save setting. Balance is now in a weighing mode.

4.2.3.3 Print Menu

The Print menu is used to configure and customize the RS232 interface parameters for your requirements on balances equipped with this function. Models without the RS232 interface do not show the ***Print*** menu item.

The following table shows the sequence in which submenus appear on the Print Menu. Factory default settings are in bold.

TABLE 4-2. PRINT MENU

POWER	Enables/disables operation of the RS232 interface by setting to *ON* or ***OFF***. Not recommended for battery operation.
Baud Rate	Specifies baud rate of either 300, 1200, **2400**, 4800, or 9600.
Data Bits	Specifies number of data bits, **7** or 8.
Parity Bit	Specifies parity type, Odd, Even, or **None**.
Stop Bits	Specifies the number of stop bits, 1 or **2.**
Auto Print	Enables either continuous, on stabilty, ***Off*** or automatic printing.
Print Stable Data	Enables/disables printing stable data only feature by setting to *On* or ***Off***.
End	Used to exit the Print menu and store your selections.

4.2.3.4 Exiting the Menu

To exit the menu and store settings, repeatedly press **Mode Off** until ***End*** is displayed, then press **Zero On**.

4.2.4 Performance Tests

Accurate performance of a Scout II balance is determined by a series of three performance tests. The displayed readings are compared with the tolerances listed in Table 4-2. Tolerance values are expressed in counts. A one count change is equal to the last digit shown on the balance display.

TABLE 4-3. TYPES OF PERFORMANCE TESTS

PERFORMANCE TEST	TOLERANCE
Precision	±1 Count
Off Center Load	±1 Count
Centered Load	±1 Count

The following performance tests are used to evaluate the balance operation before and after repairs. Each balance tested must meet the requirements specified in each test as well as the specifications listed in Table 1-2. Before proceeding with the following tests, all the procedures starting with paragraph 4.2 must have been accomplished on the balance first. Tolerance values are expressed in counts. A balance which passes each of these three tests meets the manufacturing specifications.

4.2.4.1 Precision Test

Precision is a word used in balance specifications meaning the Standard Deviation of a set of similar weight readings. To determine whether a balance meets the calculated Standard Deviation value in the Specification Table 1-2, perform the following test:

Test

1. Tare the balance. The reading on the display should be 0g.
2. Select a mass weighing near the maximum capacity of the balance and place the mass on the ***center*** of the Pan (6). Observe and record the reading.
3. Remove the mass. Reading should return to 0g ±1 count.
4. Repeat this test for ten readings. If the standard deviation of the readings is less than ±1 count, the balance passes the Precision Test.

4.2.4.1 Precision Test (Cont.)

Adjustment

If the deviation for any set of readings (using the same mass placed on the center of the Pan) is greater than $\pm$1 count, the balance does not meet the Precision Test specification. Inspect and correct the following areas:

1. Check for mechanical obstructions. Any foreign object touching any part of the moving Pan linkage assembly can cause a balance to fail the Precision Test. Inspect and correct as necessary.

2. An error in the Off-Center Load Test can affect the results of the Precision Test. Inspect and correct if necessary. See Off-Center Load Test.

3. Foreign material or debris located in the balance between the Pan Support (5) and the Top Cover (2) can cause the balance to fail the test.

4. Environmental influences such as vibrations, drafts or a non-level surface can also cause failures.

4.2.4.2 Off-Center Load Test

The Off-Center Load Test is used to determine whether displayed weight values are affected by moving the sample to different areas of the Pan (6).

Test

1. Place 1/2 of the balance capacity in the ***center*** of the Pan (6).

2. Note the reading.

3. Move the mass halfway (between the center and the edge) to the front of the Pan (6). Note any differences in the displayed weight reading.

4. Repeat this test for the back, left, and right positions of the Pan.

5. Maximum allowable change in displayed weight readings is $\pm$ 1 count for each of the four positions. If this reading is exceeded, it usually indicates a defective Transducer (8).

4.2.4.3 Centered Load Test

This test is used to determine the linearity of the unit throughout its operating range. The masses used to perform this test must be adjusted to ASTM Class 4 Tolerance, or better.

NOTE:

The balance must pass the Off-Center Load Test and Precision Test before the Centered Load Test may be performed.

4.2.4.3 Centered Load Test (Cont.)

Test

1. Place a mass equal to the maximum capacity of the balance on the center of the Pan (6) and note the reading.

2. If the displayed weight is greater than 1 count higher or lower than the value of the applied mass, proceed to paragraph 4.2.2.2 and calibrate the balance. The balance should now be calibrated in grams.

3. After completing the above adjustments, check the linearity at intermediate positions in the range between zero and maximum capacity. The displayed weight readings should be equal to the applied mass. Tolerance is ± 1 count for each of the respective weight readings. If the displayed weight values are in excess of tolerance count, proceed to paragraph 4.2.2.2 and perform a Linearity Calibration.

4.2.5 Down Stop Adjustment

Use the following procedure to adjust the Downstop Screw (21) on the Transducer (8) so that the Pan (6) "bottoms out" when the weight on the Pan (6) is 150% of the balance's capacity. Refer to Figures 4-4 and 4-5.

1. Place a mass on the Pan (6) equal to 100% of the balance capacity.

2. Gently press down on the Pan (6) and verify that there is downward movement.

3. Place a mass on the Pan (6) equal to 150% balance capacity .

4. Gently press down on the Pan (6) and check for downward movement. If the Pan (6) does not move downward, the Down Stop (21) adjustment is correct. Proceed to step 7.

5. If the Pan (6) moves down when pressed, remove the Pan (6) , rotate the Downstop Screw (21) 1/8 turn clockwise using a 5/64" Allen wrench. See Figure 4-4 for Down Stop location and Figure 4-5 which is cross sectional view of the Transducer (8).

6. Repeat steps 4 and 5 as necessary until there is no downward movement.

7. Repeat the entire procedure to verify that with 100% capacity on the Pan (6), it moves down when pressed, and with 150% capacity on the Pan (6), it does not move when pressed.

4.2.5 Down Stop Adjustment (Cont.)

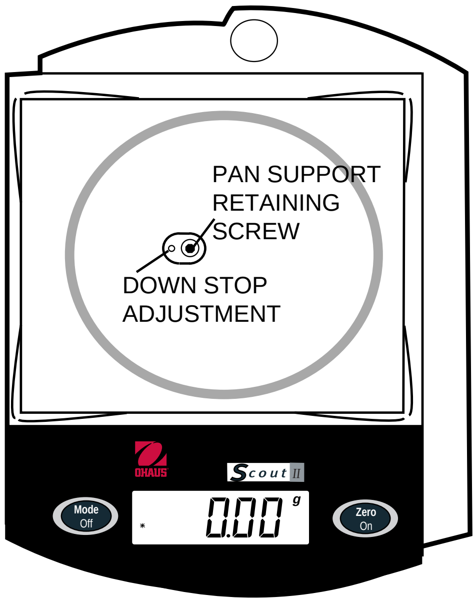


Figure 4-4. Down Stop Adjustment Location.

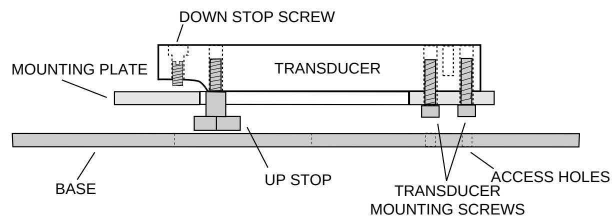


Figure 4-5. Transducer Cross Sectional View.

4.3 REPLACEMENT OF MAJOR COMPONENTS

When using this section of the Service Manual, you will find it necessary to refer to other sections. References are made to the Exploded View and Schematic Diagram which are located and identified in Chapter 5, Drawings and Parts Lists.

The decision to replace any component should only be made after thoroughly diagnosing the problem.

NOTE: Parts identified with a number can be ordered. Parts identified with a letter are not stocked and are not orderable.

If, after the replacement of any component, the balance is still nonfunctional and no other information on the subject is available in the Instruction Manual, contact:

Ohaus Corporation
19 Chapin Road
Pine Brook, NJ 07058 USA
www.ohaus.com
Tel: 973-377-9000
Fax: 973-593-0359

In the United States call Ohaus Aftermarket, toll free, 800-526-0659 between 8:00 a.m. and 4:00 p.m. EST.

4.3.1 Disassembly

This section of the manual contains detailed disassembly procedures of the balance. Refer to Figure 5-1. Before disassembling the balance, it should be noted that components inside of the balance are delicate and need to be handled with care. It is imperative that the Transducer (8) should never be subjected to any excessive torque, stress, or abraison as damage may result. Once the balance has been disassembled, any small scratch or abrasion made to any of the Individual Strain Gauges will render the entire Transducer (8) unusable. The Printed Circuit Board (4) contains integrated circuits which employ CMOS technology, therefore, caution must be exercised so as not to subject any of these components to static electricity discharge. When servicing, a wrist Ground Strap with a 10 Megohm series resistor to earth ground is highly recommended. The Printed Circuit Board (4) should be handled by grasping the edges only and never placing fingers on any of the runs or traces.

To disassemble the balance, proceed as follows:

1. Turn the balance off and if using an AC Adapter, disconnect it from the balance.

2. Remove the Pan (6) from the balance.

3. Hold the Pan Support firmly to prevent it from twisting and remove the Pan Support Retaining screw (B) and the Pan Support (5) from the balance. See Figure 4-7. ***Note: Allowing the Pan Support to rotate may damage the Transducer.***

4. If a battery is being used, turn the balance over and remove the Battery Compartment Cover (3) as shown in Figure 4-6.

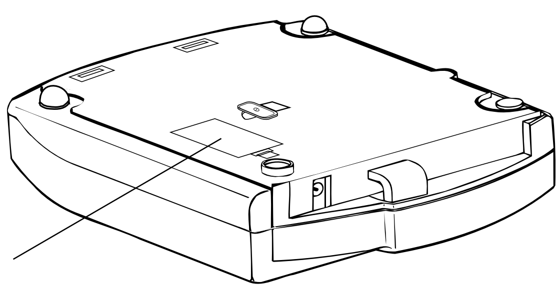


Figure 4-6. Battery Compartment Location.

5. Disconnect the 9 volt Battery from the Connector inside the balance, remove it and replace the Battery Compartment Cover (3).

6. Remove the cover Screw (A) (see Figure 4-8). On some production units, two additional screws (D) located at the bottom of the Base (1) shown in Figure 5-1 have to be removed.

4.3.1 Disassembly (Cont.)

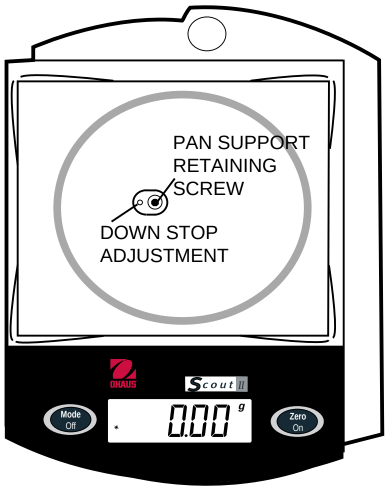


Figure 4-7. Pan Support Removal.

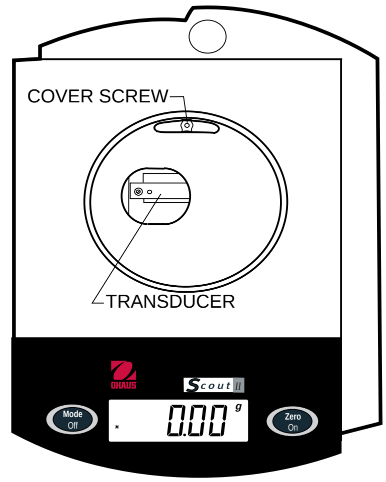


Figure 4-8. Cover Removal.

7. With the balance facing towards you, remove the Cover (2) by first pulling the two barbed tabs on the front underside of the balance forward and pushing them upwards toward the top Cover (2). After the front of the top cover is loose, lift the cover from the rear and bring it forward keeping the front edges of the top and bottom covers close together. Position the Cover (2) in front of the Base (1) (see Figure 4-9). Use care as the LCD Display (12) is connected by a ribbon cable . The balance components are now accessible for repair or replacement.

The balance is designed for easy replacement of major components. The Cover (2) is secured by one Screw (A) on top of the balance and on early production units, two screws (D) at the bottom of the Base (1). The Platform (5) is secured by one Screw (B) into the top of the Transducer (8). The Transducer (8) is fastened by two captive Screws (C) at the bottom of the balance.

The Printed Circuit Board (4) is fastened in place by clips which are part of the Base (1). The Power Board is also fastened into place by clips and a Push Nut. The Printed Circuit Board (4) and Power Board are connected by a flexible cable and is available only as a prewired assembly.

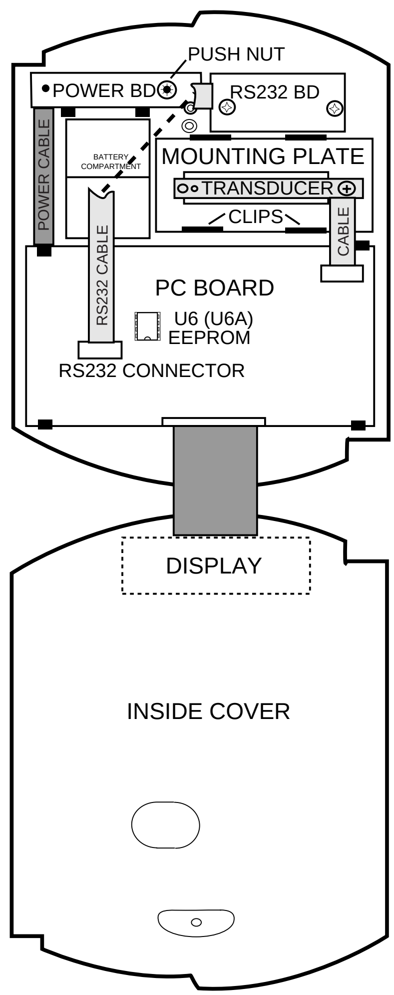


Figure 4-9. Balance Opened.

4.3.1.1 Printed Circuit Board (4) and Power Board Replacement

In an effort to keep service costs down, it is suggested that if the Printed Circuit Board (4) is suspected of being faulty, it should be replaced rather than repaired.

To replace the Printed Circuit Board (4) and Power Board, proceed as follows:

1. Disassemble the balance, refer to paragraph 4.3.1.

CAUTION

WHEN HANDLING THE PRINTED CIRCUIT BOARD, HANDLE BY EDGES ONLY! DO NOT TOUCH FOIL SIDE OF BOARD. STATIC DISCHARGE MAY DAMAGE SOME COMPONENTS.

2. The Printed Circuit Board (4) and Power Board are wired together by a short flexible cable. These parts are available wired together as a kit, refer to the parts list for part number if both boards are to be replaced. Remove the flexible cable coming from the Transducer (8) from the connector on the Printed Circuit Board (4) as shown in Figure 5-1.

3. When an RS232 board is installed, remove the RS232 Cable (18) from the connector on the Printed Circuit Board (4).

4. Unclip the Printed Circuit Board (4) from the Base (1). On the Power Board, carefully remove the Push Nut, (use care as the plastic post can be broken easily) then, unclip the Power Board from the Base (1). Remove both boards from the Base (1).

5. On 200 and 1200 gram Balances, the EEPROM (U6 or U6A) from the old PC Board must be removed and installed in the new board. See Figure 4-9 for location.

Special Note:
Some newer revision replacement boards may be supplied with an 8-pin dip socket that must be manually soldered in place. The extra socket allows maximum flexibility for using alternate types of EEPROM's. EEPROM's with manufacturer part numbers similiar to 93xxxx will require that the socket be soldered into the standard U6 position, (the set of 8 pins furthest away from U1). EEPROM types with part numbers similiar to S-29xxx require that the socket be soldered into the U6A position, (the set of 8 pins closest to U1). Determine which type of EEPROM is being used and solder the socket into the appropriate location observing the correct polarity of the socket, (polarity can be determined by the layout drawing of U6 or U6A on Figure 5-4.

4.3.1.1 Printed Circuit Board (4) and Power Board Replacement (Cont.)

6. Install the new Printed Circuit Board (4) and the Power Board to the Base (1). Make sure that all of the clips are properly secured to the boards. **Note**: If when removing the Push Nut the post was broken, secure the power board with a # 6 self-tapping screw and a flat washer. There is a hole near the edge of the board to accept a self-tapping screw which is over a boss on the bottom cover.

7. Connect the flexible cable from Transducer (8) to the connector on the Printed Circuit Board (4).

8. Connect the RS232 Cable (18) to the connector on the Printed Circuit Board (4) if the RS232 is installed.

9. Reassemble the Balance.

10. Check the performance of the balance and recalibrate.

4.3.1.2 RS232 Circuit Board (14) Replacement

To replace the RS232 Printed Circuit Board (14), proceed as follows:

1. Disassemble the balance, refer to paragraph 4.3.1.

2. The RS232 Printed Circuit Board (14) is secured to the Base (1) with two screws (E). Remove the two screws from the board. Remove the ribbon Cable (18) coming from the RS232 Board which is secured to a connector on the Printed Circuit Board (4).

3. Remove the RS232 Printed Circuit Board (14).

4. Insert the end of the ribbon Cable (18) into the connector J1 on the new RS232 Printed Circuit Board (14) before mounting. The opposite end of the ribbon Cable (18) mounts at Printed Circuit Board (4), connector J2.

5. Install the new RS232 Printed Circuit Board (14) into postion in the Base(1) and secure with the two screws previously removed.

6. Reassemble the Balance.

7. Check the performance of the balance and recalibrate.

4.3.1.3 LCD Display (12) Replacement

The LCD Display (12) is fastened to the Cover (2) by an adhesive. The display is then covered by the Function Label (13) which is also fastened to the Cover (2) by an adhesive. If the LCD display must be replaced, the Function Label must also be replaced since it is destroyed upon removal.

Refer to the parts list in section 5 for the kit number which contains both parts.
To replace the LCD, proceed as follows:1. Disassemble the balance in accordance with the procedures in paragraph 4.3.1.

2. With the Cover (2) folded back so that the inside of the balance is exposed, grasp the ribbon cable of the LCD using both hands and remove the cable from the socket on the Printed Circuit Board (4) as shown in Figure 4-9. The other end of the ribbon cable is permently mounted to the LCD.

3. Turn the Cover (2) over and remove the Function Label (13). Remove all traces of adhesive from the Cover (2).

CAUTION

USE CAUTION IN THE NEXT STEP AS THE LCD IS GLASS AND MAY BREAK IF OVERSTRESSED.

4. Carefully remove the defective LCD Display (12) from the Cover (2). Remove all traces of adhesive from the Cover (2).
5. Route the cable from the new LCD Display (12) through the opening in the Cover (2).

6. Place the replacement LCD Display (12) into position on the Cover (2). Peel off the adhesive back covering from the LCD and position the LCD on the Cover (2). Fasten the LCD Display (12) into the proper position.

7. Position the Cover (2) against the Base (1) as shown in Figure 4-9 and using both hands grasp the ribbon cable from the LCD and firmly press the cable into the connector on the Printed Circuit Board (4). Make sure that the cable is firmly seated in the connector.

8. Assemble the balance by placing the Cover (2) on top of the Base (1) and securing with the Cover screw (A) and Pan Support (5) using Screw (B).

9. Before removing the adhesive back covering, place the new Function Label (13) into position on the Cover (2) to see how the label fits. Then, remove the adhesive back covering and carefully fasten the Label into position.

4.3.1.4 Transducer (8) Replacement - 200 and 1200 Gram Models

On 200 and 1200 gram models, one or more EEPROM's is supplied in the kit. The EEPROM U6 (or U6A) must also be replaced on the Printed Circuit Board (4) when the Transducer (8) is replaced. To replace the Transducer (8) and EEPROM, proceed as follows:

CAUTION

Extreme care must be exercised so as not to twist or deform the Transducer in any way. Care should be exercised to not scratch the Strain Gauges. Any damage to the Transducer can render it inoperative.

1. Disassemble the balance in accordance with the procedures in paragraph 4.3.1.

2. Turn the balance over and loosen evenly the two Allen head captive Machine Screws (C) (until free) which secure the Transducer (8).

3. Turn the balance over again. While facing the Transducer (8) remove the Flexible Cable from the connector on the Printed Circuit Board (4) coming from the Transducer (8). (Before removing the Flexible cable, the top of connector J7 must be lifted.)

4. The Transducer (8) can be checked before replacement for the proper DC resistance. This should measure 263 ohms between adjacent legs of full bridge type transducer or 350 ohms for half bridge types. Figure 4-10 illustrates the bridge and Figure 4-11 illustrates the pin connections on the Transducer cable connector.

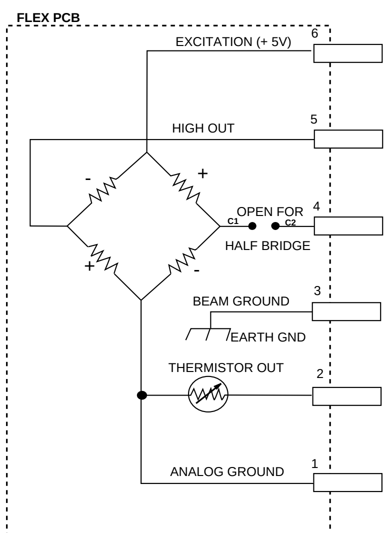


Figure 4-10. Bridge Connections.

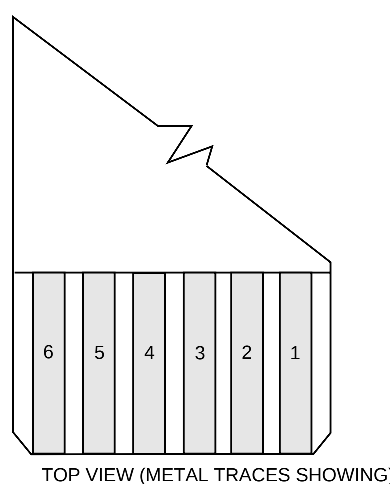


Figure 4-11. Transducer Cable Connector.

4.3.1.4 Transducer (8) Replacement - 200 and 1200 Gram Models (Cont.)

5. Ensure that the Up Stop (15) clears the Mounting Plate, then remove the Transducer (8) from the Mounting Plate. (The Mounting Plate is not field serviceable, **do not** try to remove this plate).

6. Install the new Transducer (8) Into position on the Mounting Plate in the Base (1).

7. Hold the Transducer (8) in place and turn the balance over and secure the Transducer (8) with the two captive Screws (C) on the bottom of the balance.

8. Turn the balance over again. While facing the Printed Circuit Board (4), insert the flexible cable from the Transducer (8) into the connector provided for it, on the Printed Circuit Board (4). (Press down on the top edge of connector J7 to secure the Flexible Cable.)

9. Locate IC U6 on the Printed Circuit Board (4) and remove the IC. Insert the new IC in the socket. IC U6 contains balance setup and calibration data.

Special Note:
On some newer revision Printed Circuit Boards, an alternate EEPROM type may be installed at position U6A instead of at position U6. When removing the old EEPROM, note the manufacturer number on the IC. Newer Transducer replacement kits are supplied with two EEPROM types. From the replacement kit, select the EEPROM that closely matches the part number of the older IC and use this part to make the replacement. In general, EEPROM types with manufacturer part numbers similiar to 93xxxx will be installed at position U6. EEPROM types with part numbers similiar to S-29xxx will be installed at position U6A. When replacing the IC, be sure to observe correct polarity.

10. Assemble the balance by placing the Cover (2) on top of the Base (1) and securing with the Cover screw (A) and Pan Support (5) using Screw (B).

11. Adjust the Up/Down Stop in accordance with paragraph 4.2.4.

12. Recalibrate the balance in accordance with paragraph 4.2.2.

13. Check the performance of the balance.

4.3.1.5 Transducer (8) Replacement - 400, 600 and 6000 Gram Models

To replace the Transducer, proceed as follows:

CAUTION

Extreme care must be exercised so as not to twist or deform the Transducer in any way. Care should be exercised to not scratch the Strain Gauges. Any damage to the Transducer can render it inoperative.

1. Disassemble the balance in accordance with the procedures in paragraph 4.3.1.

2. Turn the balance over and loosen evenly the two Allen head captive Machine Screws (C) (until free) which secure the Transducer (8).

3. Turn the balance over again. While facing the Transducer (8) remove the Flexible Cable from the connector on the Printed Circuit Board (4) coming from the Transducer (8). (Before removing the Flexible cable, the top of connector J7 must be lifted.)

4. The Transducer (8) can be checked before replacement for the proper DC resistance. This should measure 263 ohms between adjacent legs of full bridge type transducer or 350 ohms for half bridge types. Figure 4-10 illustrates the bridge and Figure 4-11 illustrates the pin connections on the Transducer cable connector.

5. Ensure that the Up Stop (15) clears the Mounting Plate, then remove the Transducer (8) from the Mounting Plate. (The Mounting Plate is not field serviceable, **do not** try to remove this plate).

6. Install the new Transducer (8) Into position on the Mounting Plate.

7. Hold the Transducer (8) in place and turn the balance over and secure the Transducer (8) with the two captive Screws (C) on the bottom of the balance.

8. Turn the balance over again. While facing the Printed Circuit Board (4), insert the flexible cable from the Transducer (8) into the connector provided for it, on the Printed Circuit Board (4). (Press down on the top edge of connector J7 to secure the Flexible Cable.)

9. Assemble the balance by placing the Cover (2) on top of the Base (1) and securing with the Cover screw (A) and Pan Support (5) using Screw (B).

10. Adjust the Up/Down Stop in accordance with paragraph 4.2.4.

11. Recalibrate the balance in accordance with paragraph 4.2.2.

12. Check the performance of the balance.

5.1 DRAWINGS

This section of the manual contains an exploded view, schematic diagrams and component layout drawings for Scout II balances, 200g, 400g, 600g, 1200g and 6000g. The exploded view drawing is designed to identify the parts which can be serviced on the balance in the field.

NOTE:

In all cases where a part is replaced, the balance must be thoroughly checked after the replacement is made. The balance **MUST** meet the parameters of all applicable specifications in this manual.

If further technical information is needed, in the United States call Ohaus Aftermarket toll-free 1-800-526-0659 between 8.00 a.m. and 4.00 p.m. EST. An Ohaus factory service technician will be available to provide assistance. Outside the U.S.A., please contact:

Ohaus Corporation
19 Chapin Road
Pine Brook, NJ 07058, USA
www.ohaus.com
Tel: (973) 377-9000,
Fax: (973) 593-0359

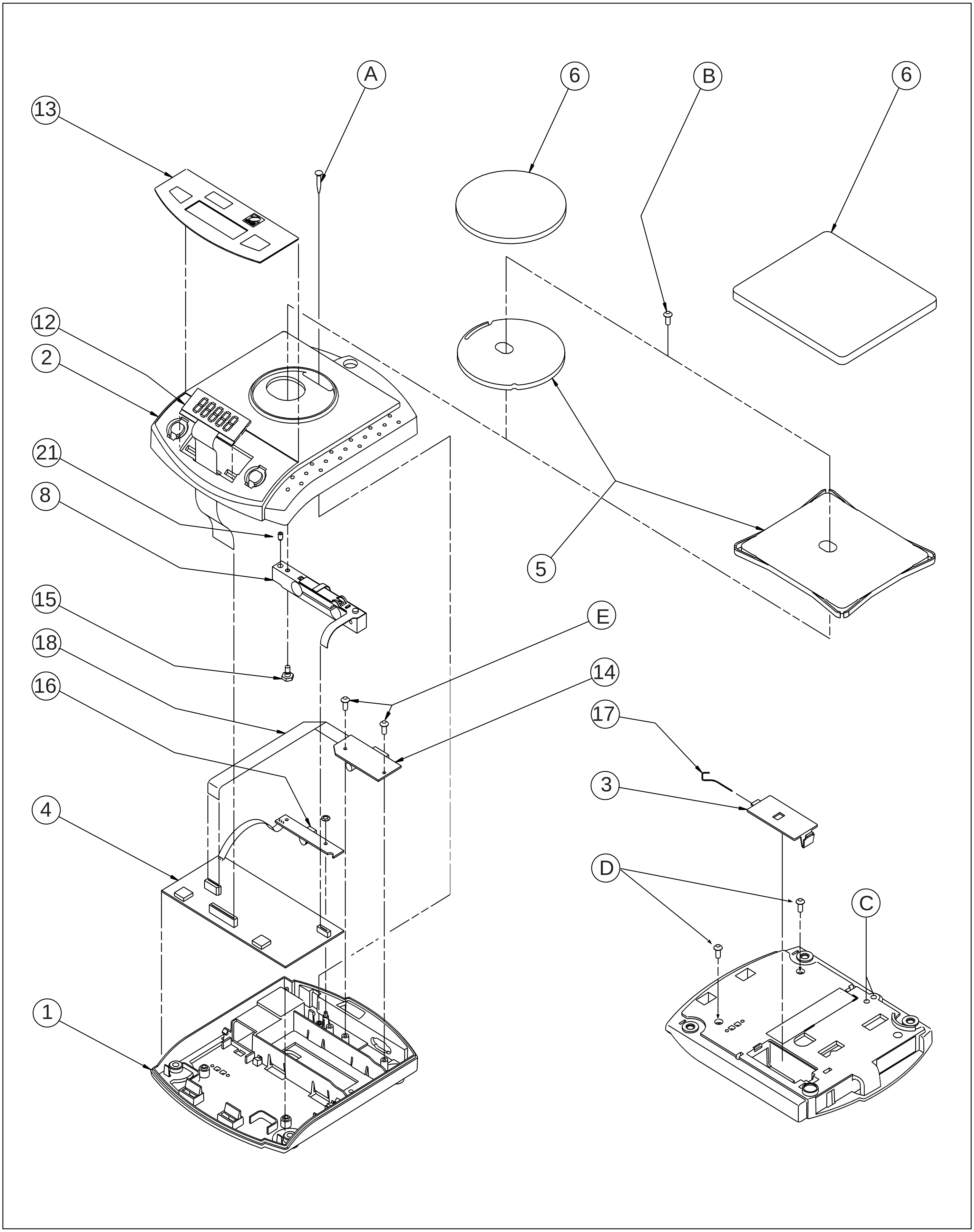
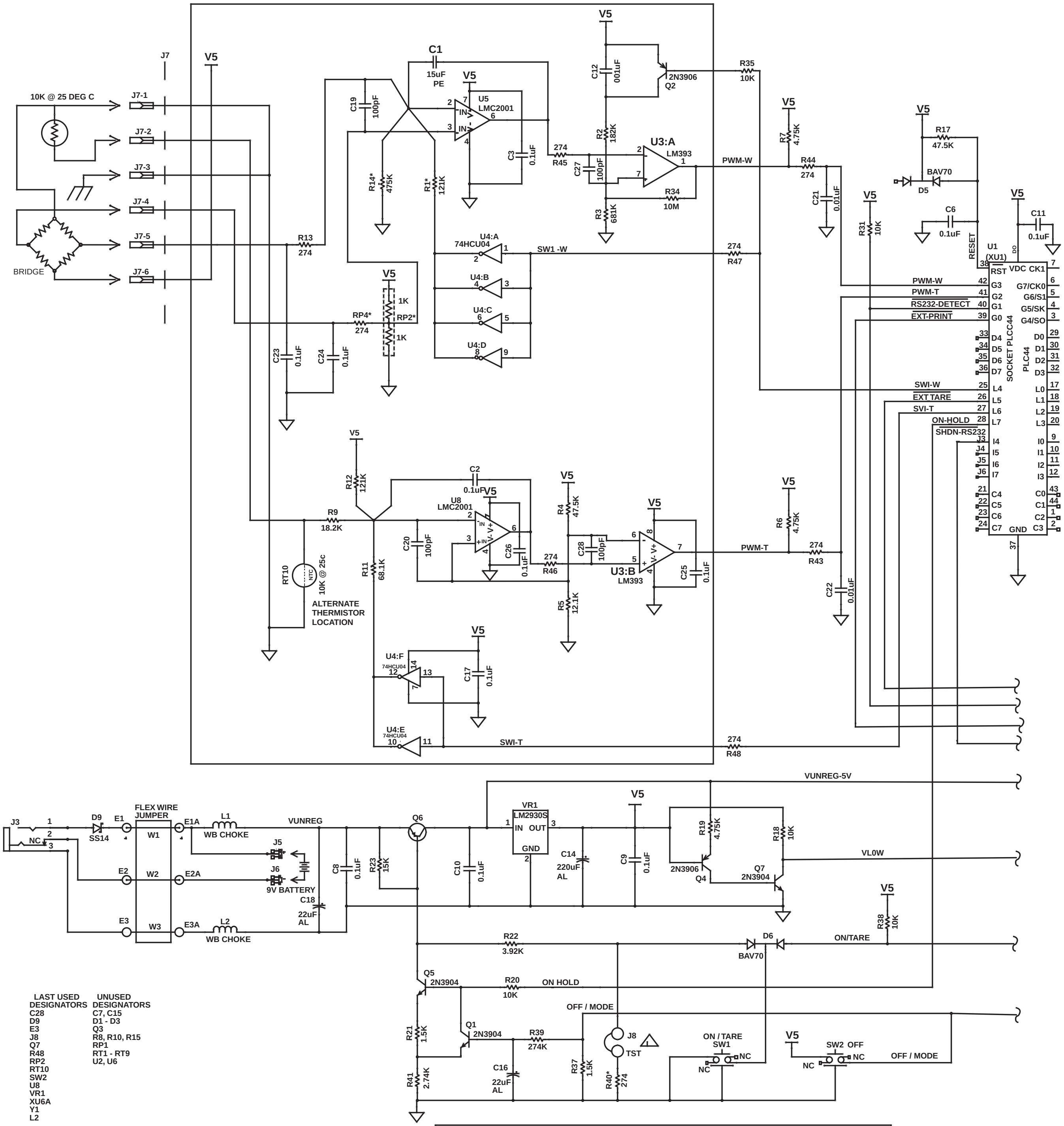


Figure 5-1. Exploded View of Balance.



***ASSEMBLY OPTIONS**

PCB ASSEMBLY TYPE	R1	R14	RP2	R24	R40	R42	D8	C24	J8	
FULL BRIDGE (FB)	681K	274K	-	274	274	1.5K	LED	0.1uF	SHORT	
HALF BRIDGE (HB)	121K	475K	1K/1K	-	-	-	-	-	OPEN	

Figure 5-2. PC Board, Schematic Diagram, Sheet 1 of 2.

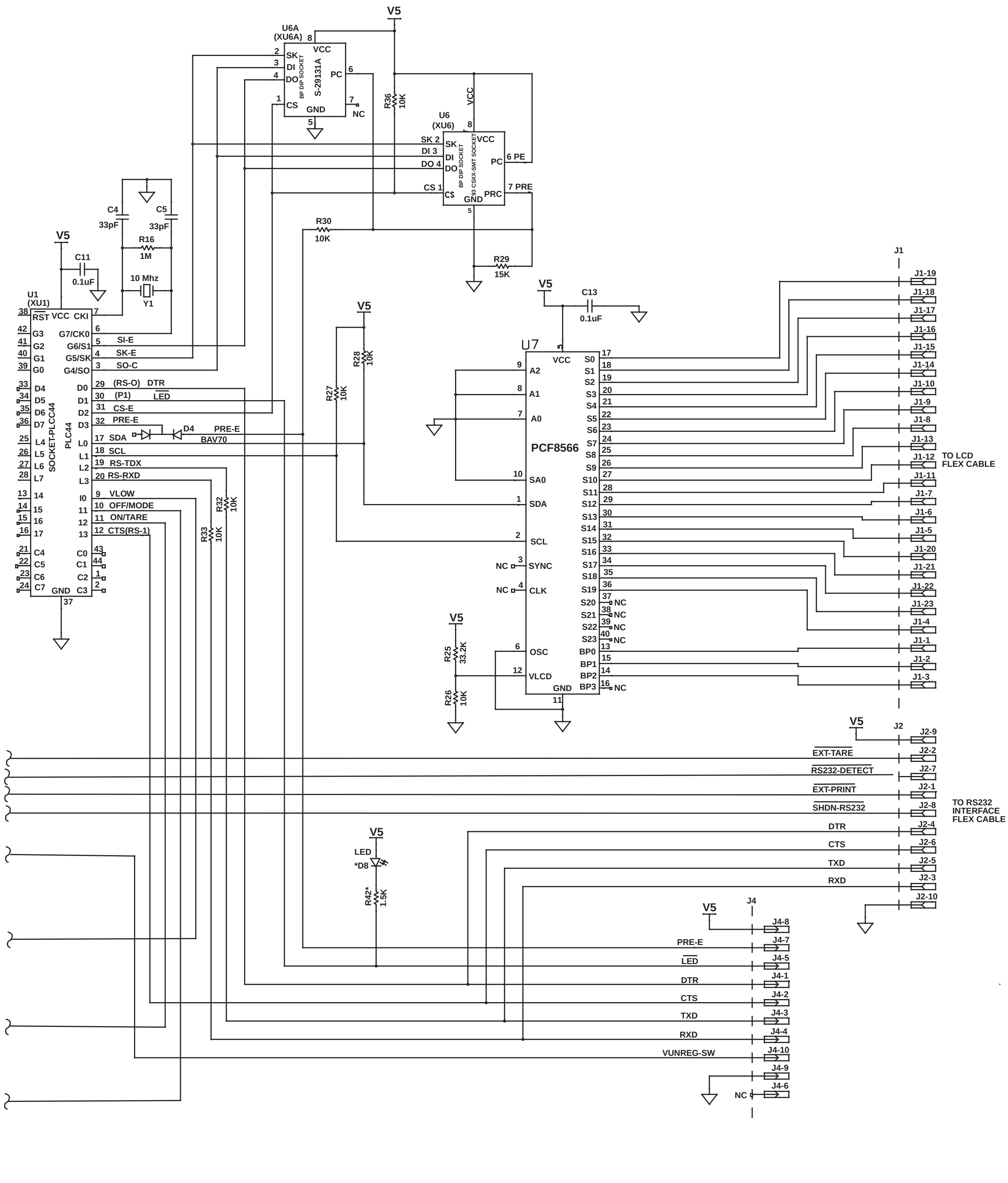


Figure 5-2. PC Board, Schematic Diagram, Sheet 2 of 2.

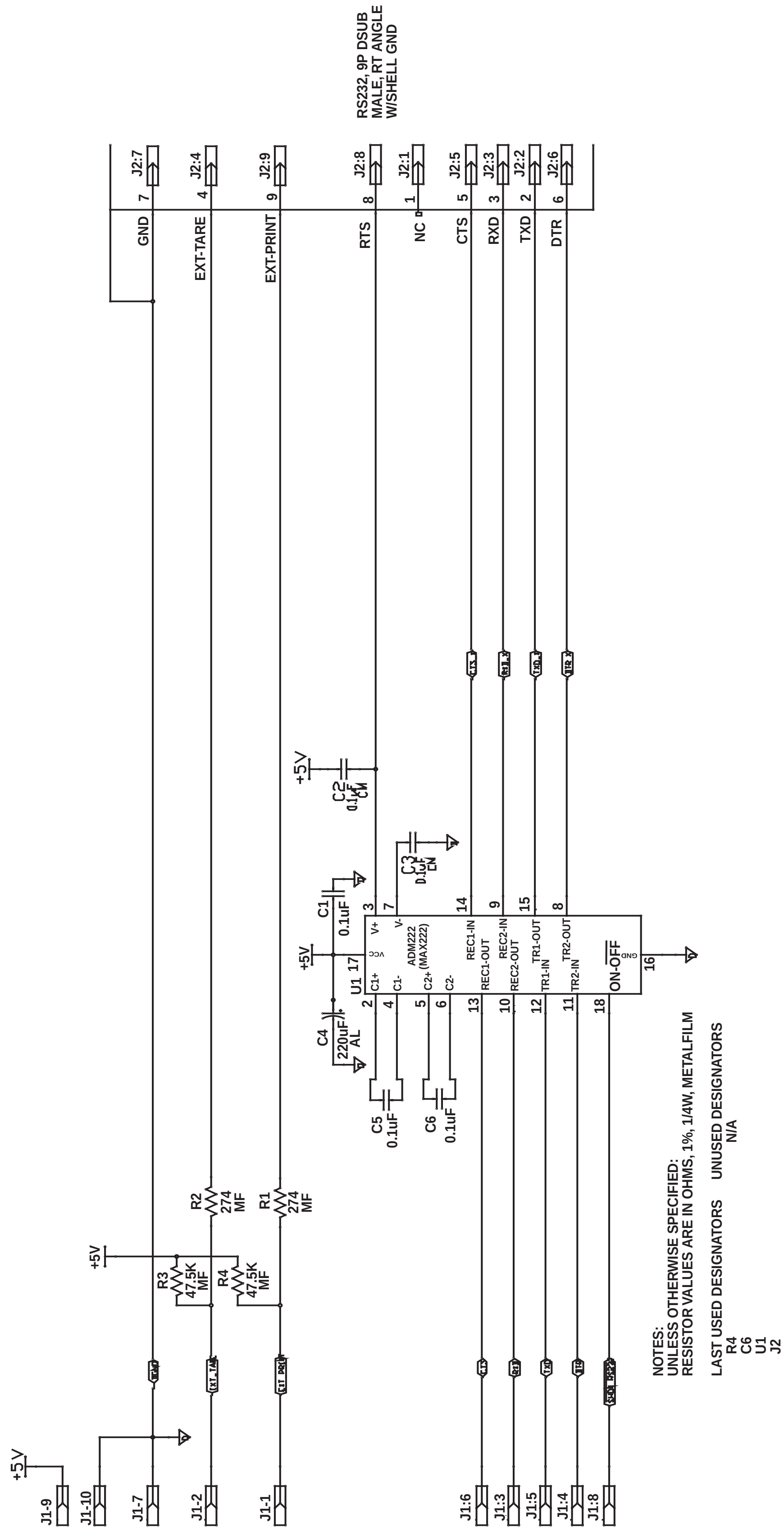


Figure 5-3. RS232 PC Board, Schematic Diagram.

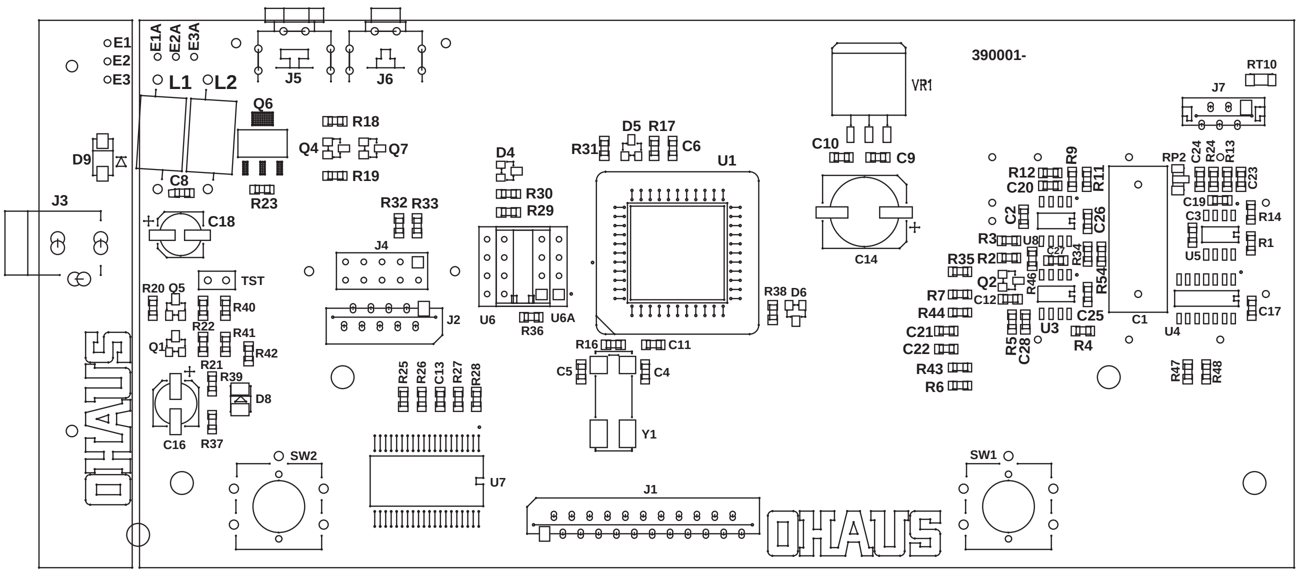


Figure 5-4. Main PC Board, Component Layout Drawing.

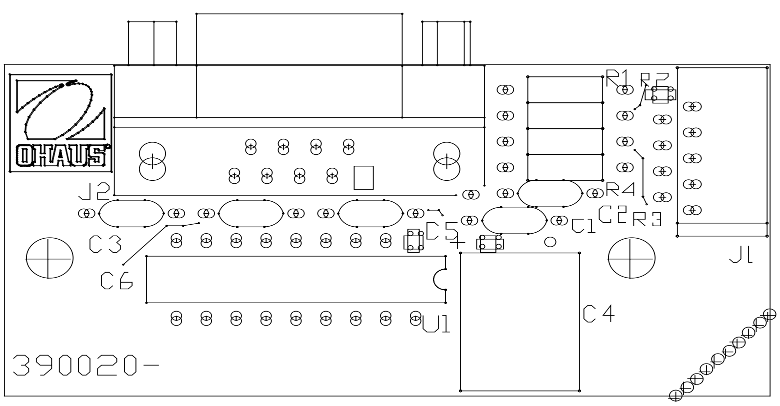


Figure 5-5. RS232 PC Board, Component layout Drawing.

CHAPTER 5 DRAWINGS AND PARTS LISTS

5.2 PARTS LISTS

This section of the manual contains the replaceable parts for the Scout II Electronic Balances, 200g, 400g, 600g 1200g and 6000g.

TABLE 5-1. REPLACEMENT PARTS LIST

KEY NO.	PART NO.	DESCRIPTION
1	71132704	Base with RS232, All
1	71131278	Base without RS232, All
2	71131280	Cover Top, All
3	71131287	Cover Battery, All
4	71135044	Replacement PCB Kit, 200g, 1200g
4	71135045	Replacement PCB Kit, 400g, 600g, 6kg
5	71131283	Pan Support, 200g
5	71131282	Pan Support, 400g, 600g, 1200g, 6kg
6	71131292	Pan, 200g
6	71131295	Pan, 400g, 600g, 1200g, 6kg
8	71135047	Replacement Transducer Kit with EEPROM, 200g, SC, SR Models, (See notes 1 and 3)
8	71135318	Replacement Transducer Kit with EEPROM, 200g SD, SE Models, (See notes 1 and 3)
8	71135048	Replacement Transducer Kit, 400g, 600g, SC, SR Models, (See note 3)
8	71135049	Replacement Transducer Kit with EEPROM, 1200g, SC, SR Models, (See notes 1 and 3)
8	71135050	Replacement Transducer Kit, 6kg, SC, SR Models, (See note 3)
12	71135315	Replacement LCD Kit, All (includes function label 13) (See note 2)
13	300004-020	Function Label, All
14	71132391	Replacement RS232 PCB

TABLE 5-1. REPLACEMENT PARTS LIST (Cont.)

15	71131268	Screw, Upstop (See note 3)
16	71131203	Power Jack, All
17	71131269	Weigh Below Hook, All
18	71132529	Cable, Internal RS232
21	H3405-21R	Setscrew, Downstop (See note 3)
---	390007-010R	Switch, (SW1, SW2)
---	90664-02R	IC, EEPROM U6, (U6A) (see note 4 below)
---	90524-66	AC Adapter 100/120 V ac US Plug (not shown)
---	90524-63	AC Adapter 220 V ac Euro Plug (not shown)
---	90524-64	AC Adapter 240 V ac UK Plug (not shown)
---	90524-65	AC Adapter 240 V ac Australian Plug (not shown)

PARTS LIST NOTES:

1. Transducers replacement kit for 200 and 1200 gram models include Transducer and one or more EEPROM's as matched sets.

2. When replacing the LCD, the Function label must also be replaced, Kit No.71135315 includes both parts.

3. Transducer kits are supplied with Upstop and Downstop screws.

4. IC, EEPROM U6, (U6A) must be pre-programmed for 400g, 600g or 6kg models. When ordering, please specify balance model type and EEPROM manufacturer part number. For 200g and 1200g models, transducer kit must be ordered which contains a matched set of EEPROM and transducer.

GENERAL NOTES:

In all cases where a part is replaced, the balance shall be thoroughly checked after the replacement is made. The balance must meet the parameters of all applicable specifications in this manual.

Ohaus replacement parts warranty only applies to parts purchased from Ohaus Corporation.