1365

Technical Manual
and
Parts Catalog

INTRODUCTION

This publication is provided solely as a guide for individuals who have received METTLER TOLEDO Technical Training in servicing the METTLER TOLEDO product.

Information regarding METTLER TOLEDO Technical Training may be obtained by writing to:

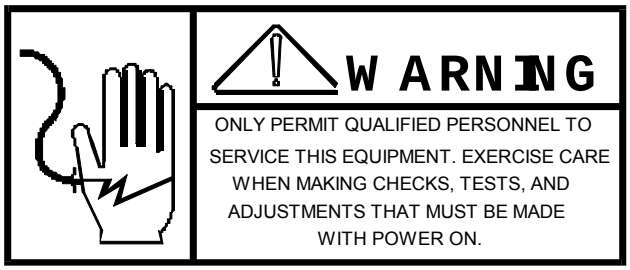
METTLER TOLEDO
Training Center
P.O. Box 1705
Columbus, Ohio 43216
(614) 438-4400

PRECAUTIONS

- **READ** this manual before operating or servicing this equipment.

- **ALWAYS REMOVE POWER** and wait at least 30 seconds **BEFORE** connecting or disconnecting any internal harnesses. Failure to observe these precautions may result in damage to, or destruction of the equipment.

- **ALWAYS** take proper precautions when handling static sensitive devices.

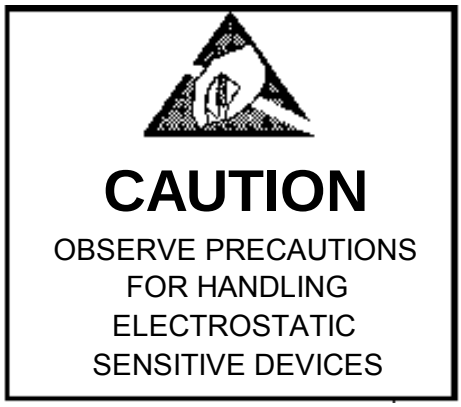


- **DO NOT** connect or disconnect a load cell scale base to the equipment with power connected or damage will result.

- **SAVE** this manual for future reference.

- **DO NOT** allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.

- **ALWAYS DISCONNECT** this equipment from the power source before servicing.



- **CALL** METTLER TOLEDO for parts, information, and service.

1. GENERAL DESCRIPTION

The Model 1365 digital baby scale provides a Gross or Net weight display , self calibration and weight lock features. Available is an optional battery power pack which will power the unit for eight hours of operation, after being fully charged.

FEATURES

--Automatic Zero Maintenance (within ±2% of scale capacity from zero).

--Pushbutton zeroing (within ±2% scale capacity form zero).

--6 digit display of .5" high vacuum fluorescent display.

--"Weight Lock" -- averages 16 scale updates and freezes the display to allow reading and recording of weight data when the infant is moving on platform.

--Pushbutton tare.

--6 mode legends with indicators.

--Overcapacity blanking at 5 increments over programmed scale capacity.

--Selectable power input levels.

--8 hour battery power option.

--Programmable increment selection.

2. SYSTEM DESCRIPTION

The Model 1365 provides 15 volts of excitation to an internally mounted Moment Insensitive Load Cell. This excitation is gated so that zero and span drift, due to excitation is gated so that zero and span drift, due to temperature changes, are compensated. The instrument conditions the microvolt signal received from the load cell and amplifies it to a maximum level of 10 volts. This voltage is then filtered and converted to the digital equivalent and displayed.

The 1365 consists of four major blocks.

1. Load Cell -- Used to convert the applied force into a voltage level.

2. Main PCB -- Contains the scale logic, load cell supply and program selection switches.

3. Keyboard -- This allows operator interface for features such as lb/kg selection, pushbutton zero and printing.

4. Power Supply Assembly - Used to convert the AC power to various DC voltage levels used on the Main PCB.

THIS POWER SUPPLY IS DESIGNED FOR HOSPITAL TYPE ENVIRONMENTS AND MEETS ALL CURRENT HOSPITAL U.L. REQUIREMENTS. BECAUSE OF THIS, THE ASSEMBLY OR ANY PART OF THE ASSEMBLY MAY NOT BE REPLACED WITH ANY REPLACEMENT PART OTHER THAN IS LISTED IN THE RECOMMENDED SPARE PARTS (SECTION VII) OF THIS MANUAL.

Also available is an optional battery power accessory, which allows for full portability of the scale for up to eight (8) hours. The battery is automatically recharged when the unit is operated by AC power or it may be recharged by an optional battery status, and automatic display blanking occurs when a low battery condition is detected.

3. SPECIFICATIONS

3.1.1 ELECTRICAL AND PHYSICAL SPECIFICATION

A). ENVIRONMENT
The Model 1365 is intended for hospital or office type environments with ambient temperatures from =50°F (+10°C) to + 122°F(+40°C), at 10 to 95% relative humidity, non-condensing.

B). TEMPERATURE STABILITY
The span temperature coefficient is:

Electronics	= 8PPM/°C
+Load Cell	= 20 PPM/°C
Total Unit	= 28 PPM/°C

The zero temperature coefficient is:

Electronics	= 0.25 microvolts/ º C
+ Load Cell	= 0.60 microvolts/ º C
Total Unit	= 0.85 microvolts / º C

C). POWER REQUIREMENTS
The unit is operable upon selection, at 120V, 220V and 240VAC, (+10 to --15%), 50 to 60 Hz. The unit will also operate on an optional 12 VDC battery power accessory. Power consumption is approximately 25 watts.

D). FUSE RATINGS ARE 0.15A SLOW BLOW.

CAUTION: All units are shipped for 120 VAC operation. Refer to Section 4 for alternate voltage selection.

E). APPEARANCE AND DIMENSIONS
The Model 1365 cover is fog white with a flat black base plate and bezel assembly. The unit is 6.5 inches (16.5 cm) tall, without cradle, x 16.70 inches (42.4 cm) wide x 19.88 inches (50.5 cm) deep. The 1365 weights approximately 30 lb (13.6/kg).

F). UL LISTED
Materials, components and electrical design comply with UL 544 standard for safety of medical and dental equipment, including grounding of all metal parts and fusing.

3.1.2 EXTERNAL FUNCTIONS

The 1365 keyboard controls all control and printing functions. The keyboard contains 8 keys which provide various functions such as ; lb to kg Switching, Auto Tare , Weight Lock and Print.

For a detailed description of all keyboard functions refer to Section 5.

3.1.3 DISPLAY FORMAT

The display bezel consists of a six character, 0.5 inch high vacuum fluorescent weight display, as well as six mode indicators. These indicators are used to indicate the present mode of operation.

4. INSTALLATION INSTRUCTIONS

4.1 SET-UP PROCEDURE

a). Upon removing the scale from the shipping carton, inspect the outside of the unit for any loose or damaged parts.

b). Remove the top cover and bezel assembly and continue the inspection, checking to assure that all interconnecting harnesses and mounting hardware are securely fastened.

c). Check the voltage input selection switch, see Figure 1, to insure that the proper voltage is selected for use in each installation.

CAUTION: All units are shipped for 120 VAC operation.

If the voltage selection switch requires changing, simply loosen the two retaining bracket screws and slide the retaining bracket until the selection switch is in the correct position for the voltage required and tighten the retaining bracket screws.

d). Install, if purchased, the battery power pack option. Refer to Section D for a more detailed description of this installation procedure.

e). Re-install the top cover and bezel assembly, using the white trim strips in place of the shipping straps. Next, install the cradle assembly.

NOTE: When re-installing the top cover, be certain that the overload stop screws do not touch the cover and cause interference. Be sure to tighten cover screws tightly to insure that the cover will not move.

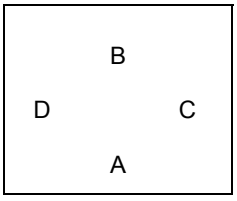
f). Apply power and allow 1/2 hour for warm-up.

g). At this time check the unit for a shift error. A shift test is acceptable only if all of the following guidelines are met.

--Test weights equal to 1/2 scale capacity are used.

--Scale is operating in the expand mode (SW 1-1 ON) (10 times normal sensitivity).

--Weights are placed on any one of the four points shown below and the indication does not differ form the other three points by more than 15 expanded increments.

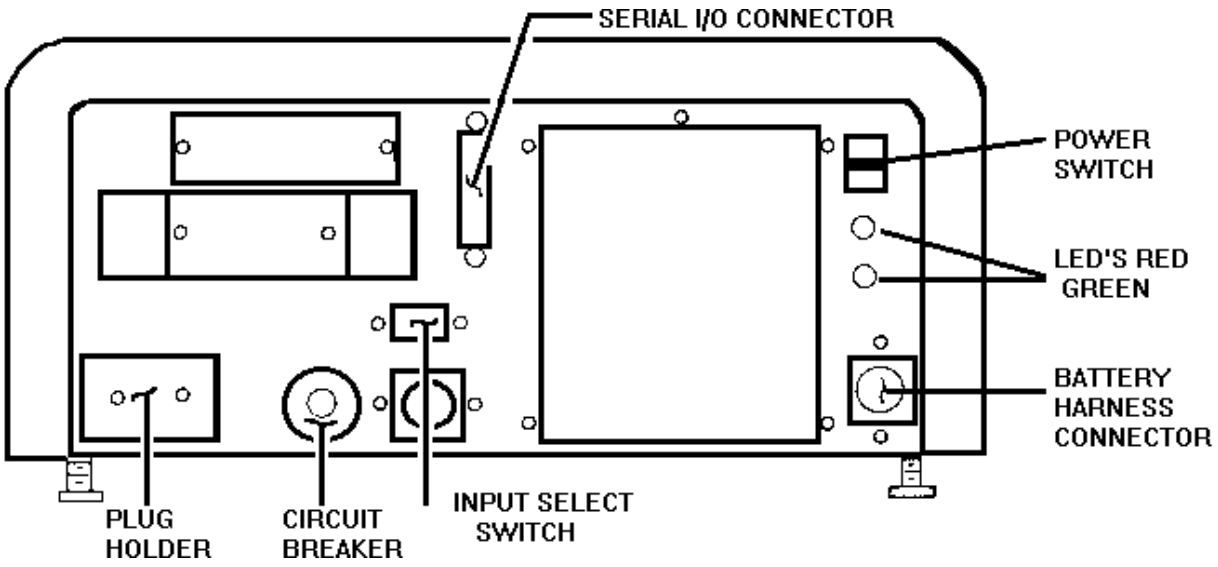


NOTE: The diagrammed points ar 1/2 the distance from the center of the platter to the edge of the platter.

If a shift error does exist, the two possible causes for this are:
1) a mechanical bind or defect, or
2) a defective load cell.

h). Return switch SW1-1 to the OFF position.

i). Set all programming switches for the proper operation of your installation. Refer to Section C for a detailed program switch summary.



4.2 CALIBRATION

When calibrating the unit, first check the programming switches on the Main PCB for the correct setting of the capacity and display selections.

a). Calibrating the Unit using the Auto Calibration Pushbutton.

This feature is used to allow calibration of the unit without removing the top cover. This can only be used with a 5 lb test weight (a two kilogram test weight if unit is set-up in the metric only mode) and is limited to corrections of ±0.2% of the applied test load, or ±0.01 lb when using a 5 lb test weight. This feature will work only if switch 2-4 on the Main PCB is in the ON position.

Auto-Calibration Procedure:

1. After unit is unlocked, leveled, and allowed to warm-up for a minimum of 1/2 hour, with no weight on the platform -- Press the ZERO pushbutton. At this time the blinking will stop and the display will read zero.

2. Press the "calib" pushbutton.

3. Place a five pound test weight on the center of the cradle. The weight indication should display 5.00 lb plus or minus 0.01 lb. Errors greater than ±0.01 lb will not be compensated for, they must be corrected by using the span pot on the Main PCB.

4. Press the "calib" pushbutton gain and the display will read 5.00 lb. Remove the test weight and the unit is now calibrated and ready to use.

b). Calibrating the Unit Manually

1. Remove the cradle, top cover and display PCB.

2. Reinstall the cradle with the top cover removed.

3. Apply power to the unit.

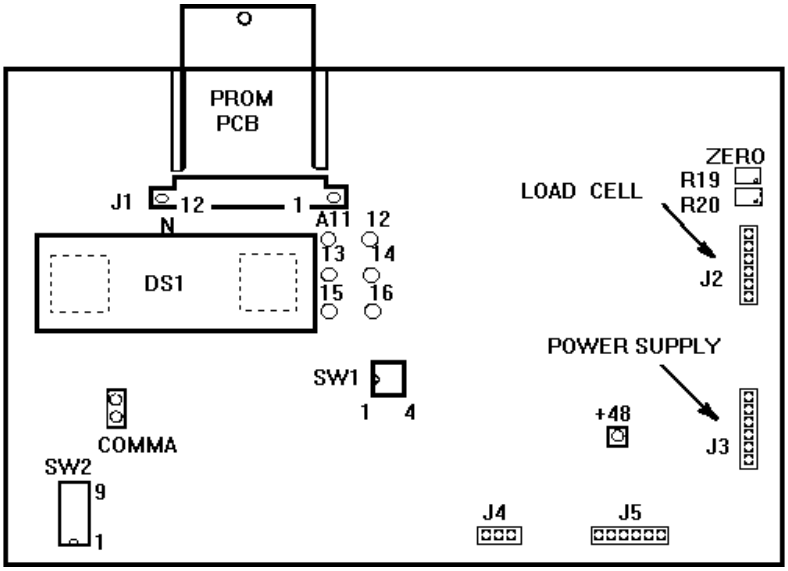
4. Adjust the zero pot (R-19) until the display stops blinking and reads ZERO.

5. Place a test weight equal to at least 15% of unit capacity on the cradle. Adjust the span pot (R20) until the display reads equal to the applied test weight.

6. Remove the test weight. The display should read ZERO. Repeat steps "d" and "e" as required.

7. The final calibration test should be done using test weights equal to full capacity.

8. Reinstall the display PCB and cover.



4.3 PROGRAM SWITCH SUMMARY

It is important that you first check the Technical Manual of the printer (if a printer is to be used), for any switch settings that may affect the printer operation or the print format, prior to connecting the 1365 to the printer..

SW1-1 EXPAND (For Calibration Only)

ON --The display will be expanded for calibration.
OFF --Normal operating mode.

SW1-2 CRADLE SELECTION

ON --When the large four sided cradle is used.
OFF --When the standard two sided cradle is used.

SW1-3 WEIGHT - LOCK

ON --Weight - Lock feature will operate.
OFF --Weight - Lock feature will not operate.

NOTE lb/g switching is available in the "B" revision or higher Paddle PCB when in the weight - lock mode.

SW1-4 AUTO CALIBRATE

ON --Auto Calibrate feature will operate.
OFF --Auto Calibrate feature will not operate.

SW2-1 -] NOT USED (should be OFF)
SW2-2 -]
SW2-3 -] MODE AND CAPACITY SELECTION
SW2-4 -]

MODE AND CAPACITY	SW2-2	SW2-3	SW2-4
300lb x .01 ("lb"--"g" switch-able via front panel pushbutton)	OFF	OFF	ON
15,000g x 5g ("g" only -- not switchable via front panel)	OFF	OFF	OFF

SW2-5 NOT USED (should be OFF)

SW2-6 AUTO CLEAR

ON --Tare will automatically clear when the indication returns to zero. (The scale must first settle at some weight value greater than 10 increments above zero).
OFF --Tare may only be cleared by using the "C" (Clear) pushbutton.

SW2-7]
SW2-8] NOT USED

SW2-9 POUNDS DISPLAY SELECTION

ON --Display is in pounds only (XX.XX lb).
OFF --Display is in pounds and ounces (XX-XX.X lb-oz).

MAIN PCB JUMPER SETTING
There is one (1) program jumper located in the lower left hand corner of the Main PCB. This jumper is used only to illuminate a comma on the display.

ON --(Jumper Connected) A comma is used in place of the decimal point on the display.
OFF --(Jumper Disconnected) A decimal point is used on the display.

4.4 OPTIONAL BATTERY PACK INSTALLATION

When installing the optional battery pack (0919-0010), use the following steps as an installation aid in addition to the installation instructions 119871.

a). Remove power from the unit.

b). Remove the cradle and top cover assembly.

c). Remove the five (5) retaining screws which hold the battery cavity cover plate (located on the rear of the unit) and discard this cover plate as it is no longer required. Reinstall the retaining screws.

d). Remove P-3 from the Main PCB (this is the harness from the power Supply Assembly).

e). Install battery Charger PCB by snapping the PCB in place onto the four existing plastic clips.

f). Place the Bridge Rectifier onto the existing mounting stud and tighten. Connect the rectifier harness onto J-11 of the Charger PCB.

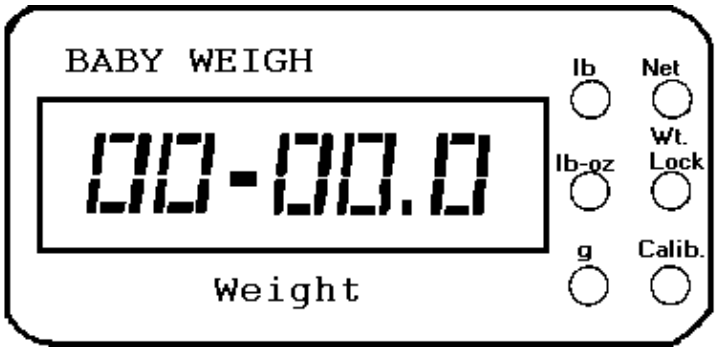
g). Connect P-3 (Power Supply Harness) onto J-7 of the Charger PCB

i). Install the interconnecting harness onto J-8 of the Charge PCB and J-3 of the Main PCB and connect TP1 on the Battery Charger PCB to pin labeled +48 on the Main PCB with the single wire portion o f the harness.

j). Slide battery into battery cavity and connect pigtail to the rear mounted connector (J-2).

5. OPERATION INSTRUCTIONS

5.1 OPERATOR'S PANEL DESCRIPTION



LED's will light when respective mode is selected.

LB -- Selects a weight indication in pounds or, if internally selected, pounds and ounces.

G -- Selects a weight indication in grams.

WEIGHT LOCK -- Display locks on averaged weight determined from 16 internally updated readings per second, accommodating movement on the cradle.

PRINT -- Transmits weight data to a printer or other compatible peripheral device.

Z -- Automatically tares (subtracts) the weight of the object on the scale. The NET legend remains on after a tare has been entered. Tare range is 100% of capacity.

C -- Clears tare an weigh lock functions and verifies display segments.

CALIB -- With a 5 lb test weight on the scale, pressing the button adjust the calibration of the scale, if required. Total adjustment range is ±0.01 lb.

5.2 OPERATING SEQUENCE

a). Press the "Z" key for approximately two seconds to zero the scale (if required).

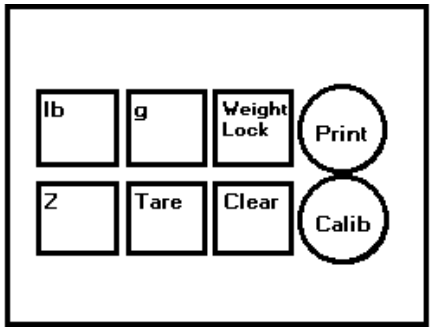
b). If blankets or protective wraps for the child are used lace them on the cradle then press the "T" key to tare (subtract) their weight. The NET legend will light. To remove tare function, press the "C" key.

c). Place the child on the scale and read the displayed weight. Pressing either the "lb" or "g" key will alternate the display between avoirdupois and metric readings and the corresponding legend will light.

d). If movement from the child causes the displayed weight to fluctuate, press the "Weight Lock" key an the displayed weight will freeze on an averaged weight. The corresponding legend will light. To remove the Weight Lock function, press the "C" key.

e). If a printer or other compatible peripheral device is connected to the scale, press the "Print" key to transmit the weight data and cycle the printer.

USE OF THE CALIBRATION FEATURE:



1. Depress the "Z" key for approximately two seconds.

2. Press the "Calib" key. Display will read "Calib."

3. Place the 5 lb test weight on the cradle.

4. Press the "Calib" key again.

5. Indication should read 5,000 lb. The scale is not calibrated through full capacity. Correction is limited to ±0.01 lb or ±4g.

6. PREVENTIVE MAINTENANCE

The Model 1365 is deigned to require a minimum of maintenance and service. This section provides instructions and procedures for the maintenance of this unit, as well as a troubleshooting guide to aid in problem analysis.

It is suggested that assistance from Toledo Scale service personnel be requested in the event a problem should arise that is beyond the scope of this technical manual.

6.1 REQUIRED TOOLS AND SUPPLIES

The following items are recommended for maintenance and repairs of the unit. Common hand tools ares also required:

- Volt -- Ohmmeter
- Load Cell Simulator (F/N 100865 00A)
- Cleaning Cloth
- Static Bags
- Static Wrist Strap

6.2 MAINTENANCE SCHEDULE

The frequency at which normal maintenance (cleaning and inspection) should be performed, is twice a year.

6.3 CLEANING

Clean the keyboard and cover with a soft clean

6.4 TROUBLESHOOTING

a). If operational difficulties are encountered, obtain as much information as possible regarding the particular trouble, as this may eliminate a lengthy, detailed checkout procedure.

b). Check fuses, primary power lines, external circuit elements and related wiring for possible defects. Failures and malfunctions often may be traced to simple causes such as loose or improper circuits, power supply connection or fuse failure.

c). Use the electrical interconnecting diagram as an aid to locating trouble causes. This diagram as an aid to locating trouble causes. This diagram contains various voltage measurements that are average for normal operation. Use instrument probes carefully to avoid causing short circuits and damaging circuit components.

d). A printed circuit board believed to be defective may be checked by replacing it with a known good PCB, and then observing whether the problem is corrected. WHEN HANDLING A PCB, USE A STATIC BAG FOR BOTH THE NEW AND DEFECTIVE PCB. When replacing a suspected faulty PCB, do not program the replacement PCB form the original one as the malfunction may be cased by a programming error. Use the proper technical manual to determine in what position the switches and/or jumpers should be.

NOTE: When replacing the Main PCB (P/N G11177800A) with a new Main PCB, be sure the insulator cap and fish paper insulator are re-installed along with the PCB.

e). To verify the problem, as being in the removed PCB, reinstall the defective PCB and retest. This simple test will eliminate the possibility of having replaced a good PCB because of a loose or poor connection. Exchange PCB's or sub-assemblies are available from your authorized Toledo Scale representative.

6.5 TESTING THE OPERATIONAL VOLTAGES

a). Load Cell Excitation

This excitation voltage is gated off and on and therefore, cannot be measured accurately with a voltmeter because they generally measure average voltage.

The voltage when measured with a voltmeter will be:

J-2 Piin 9 to Pin 7= +3.7 VDC
J-2 Pin 1 to Pin 7 = --3.7 VDC
J-2 Pin 1 to Pin 9 = +7.5 VDC

The raw supply voltages can be measured at the filter capacitors mounted on the Main PCB. These capacitors are labeled C54 and C53 and will read +VDC and --VDC respectively. The input voltage for these capacitors can be measured on J-3, as follows.

P-3 Pin 7 to Pin 9= 22 VAC
P-3 Pin 8 to Pin 9 = 22VAC
P-3 Pin 7 to Pin 8 = 44VAC

b). Logic Supply Voltage

A-C SUPPLY VOLTAGE	A-C VOLTAGE	REC. BRIDGE	FILTER CAPACITY	REGULATOR	D-C VOLTAGE	TEST POINT	MAX. RIPPLE
J-3 Pin 2 and 3	10 VAC	CR4	C55	Q8	+5VDC	C58	.1VAC
J-3 Pin 7 and 8	44 VAC	CR9	C54	Q6	+15VDC	C49	.2VAC
J-3 Pin 7 and 8	44 VAC	CR9	C53	Q5	--15VDC	C48	.2VAC
J-3 Pin 8 and 9	22 VAC	CR5 and 6	C57	--	--48VDC	TP1	.4VAC

7. PARTS REPLACEMENT

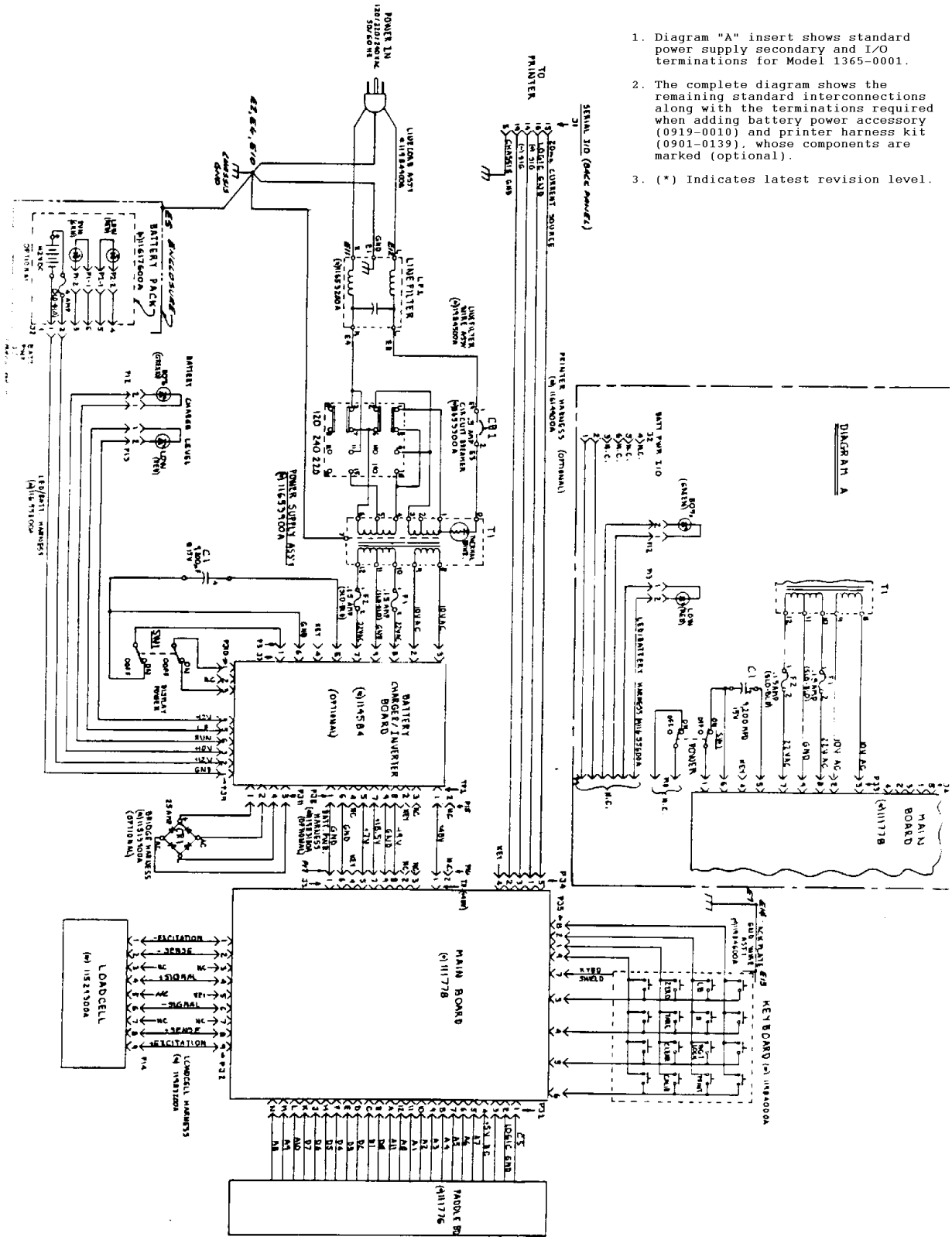
RECOMMENDED SPARE PARTS

PART NUMBER	DESCRIPTION
G111778 00A	Main PCB
B116538 00A	Prom PCB
095920 00A	Fuse .25A Slo Blo
116539 00A	Power Supply Assembly*

*The following parts are used in the Power Supply Assembly and are NOT replaceable with any other part than the ones listed.

PART NUMBER	DESCRIPTION
116531 00A	Line Cord
116532 00A	Line Filter
116533 00A	Circuit Breaker
A116534 00A	Transformer
116036 00A	Line Cord Relief

8. SCHEMATIC


1. Diagram "A" insert shows standard power supply secondary and I/O terminations for Model 1365-0001.
2. The complete diagram shows the remaining standard interconnections along with the terminations required when adding battery power accessory (0919-0010) and printer harness kit (0901-0139), whose components are marked (optional).
3. (*) Indicates latest revision level.
DIAGRAM A
MAIN BOARD
KEYBOARD
LOADCELL
BATTERY CHARGER/INVERTER BOARD
POWER SUPPLY ASSY
BATTERY PACK
LINE FILTER
PRINTER HARNESS (OPTIONAL)
SERIAL I/O (BACK PANEL)
TO PRINTER