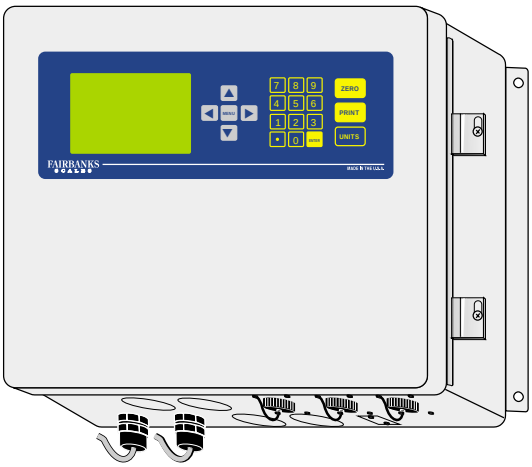
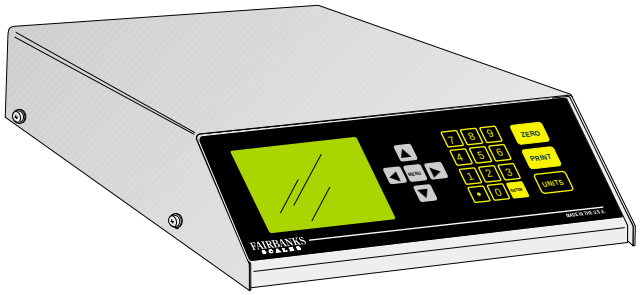
Service Manual

IND-R2500-F1 & IND-HR2500-F1 Indicators with Intalogix Technology





50525
Issue #11 11/03

Amendment Record

IND-R2500-F1 & IND-HR2500-F1
with Intalogix™ Technology
50525

Manufactured by Fairbanks Scales Inc.
821 Locust
Kansas City, Missouri 64106

Created

Issue # 1

Issue # 2

Issue # 3

Issue # 4

Issue # 5

Issue # 6

Issue # 7

Issue # 8

Issue # 9

Issue #10 8/99 Added: New Software, Added 610 Printer, Added New 5-digit part numbers.

Issue #11 11/03 Updated Printer Information, Added Programmable Output

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Disclaimer

Every effort has been made to provide complete and accurate information in this manual. However, although this manual may include a specifically identified warranty notice for the product, Fairbanks Scales makes no representations or warranties with respect to the contents of this manual, and reserves the right to make changes to this manual without notice when and as improvements are made.

SECTION 1:
Intalogix, Introduction / Description

A. Introduction:

Intalogix™ Technology is a unique communication system for addressing each (analog) load cell in a scale system that allows outstanding resolution, performance, and diagnostic capabilities.

B. Description:

The IND-R2500-F1 is the standard indicator, and the IND-HR2500-F1 is intended for hostile environments. The instrument supplies 30 VAC and 20 VDC to the pit power supply (PS) located at the scale platform. The PS converts the AC to DC voltage, partially regulates it, and makes it available to the sectional controller (SC) where it is further regulated and used for excitation voltage to the load cells.

The 20 VDC is regulated in the PS and used to supply the RS 485 serial communications circuit. The dipswitch setting in the SC assigns a digital ID to that SC, and therefore to each section and to each cell. In the SC, the load cell analog signal is converted to a digital signal, then to an RS 485 signal. The RS 485 serial communication from each SC is returned through the pit power supply to the instrument, where it is displayed as both counts and weight information per the programming parameters in the instrument.

The standard system will handle up to 16 load cells, to a maximum of 32 cells through inquiry. The system is designed to handle a wide variety of printers, computers, and remote displays. A common configuration has a printer, connected to one of the communication ports and a remote display connected to the dedicated communications port. A keyboard, Accessory 14758, is recommend for use with the system. A port for the keyboard is standard on the indicator. Accessory 15323 is needed for the modem service option.

C. Hardware Specifications

Environmental:

Enclosure, 13 ga 304 stainless steel for office or general industrial use
Temperature, recommended 14°F to 104°F, (-10°C to 40°C)
Humidity, 95% relative humidity non-condensing
Ventilation, none required
Dust, non-conducting, non-corrosive
Power, 100 VAC to 130 VAC or 200 VAC to 260 VAC, 50Hz/60Hz
Power Consumption, 1 amp maximum at 115 VAC nominal

Number of Cells:	up to 16 ea 700 ohm standard, more through inquiry
	up to 10 ea 350 ohm standard, more through inquiry
	Scale can be located up to 1500 feet from the instrument

Certification: NTEP CC# 95-044 (April 1995)
UL (May 1995)
CSA (AM5161)
OIML (Pending)

Led Graphic Display: (168 x 128 or 16 lines @ 26 [5x7 matrix size] Characters/line)
LED Backlighting (Yellow)

Character Sizes: 5 x 7 normal
5 x 14 normal enhanced
10 x 14 large
15 x 21 extra large

Memory: Basic 64K battery backed non-volatile (Battery life, typically 2 years)
Expansion to 320K

Serial I/O: 20mA Optically isolated Remote display interface
COM 2 Full 9 pin (modem compatible) RS 232C
COM 3 RS 232C (4 Wire)

Expansion: COM 4 Full 9 pin (modem compatible) RS 232C
COM 5 RS 232C (4 wire) or RS 485

Flow Control: Hardware CTS/RTS, Software X ON/X OFF.

Parallel I/O: 4 Optically DC isolated inputs (10mA)
4 Optically isolated DC outputs, TTL outputs

Keyboard: Oversized keypad, 9 Function keys 0 through 9 and decimal point
104 key PC compatible alphanumeric keyboard (Both keyboard and keypad can be operated in unison to complement each other).

Clock: Real time clock, day of the week, 12 hour am/pm, 24 hour, alpha month representation, month/day/year (2 or 4 digit year) date format.

Peripherals: 50-3925 Ticket printer
50-3950 Ticket Printer
50-3960 Ticket printer
SP2200 Ticket Printer
IDS 152 Ticket Printer
590 Ticket Printer
295 Ticket Printer
SP2000 Ticket Printer
PTR 610 Ticket Printer
50-3715/3550 Tape printer
50-3921 Form printer (Tickets or Reports)
OKI320/520 Form printer
Remote display continuous or demand display
Continuous, refresh after each display update cycle
Demand, refresh after each print cycle
Time, Can be programmed to show time when weight data is at zero 10 or more seconds
Custom Driver, commands to control printers or a computer program interface

Commands include:

TICKET INITIALIZATION
CHARACTER SIZE
DOUBLE WIDTH CHARACTERS
LINE FEED
FORM FEED
REPORT INITIALIZATION

These commands are not limited to the above function and can be used to perform other functions (i.e. FORM FEED could be used to operate a printer cutter blade)
Computer: IBM PC Software is available to support a number of data transfers
Modem: Hayes compatible modems from 300 baud to 19200 baud.

Number of Scales:

1, 2, 3, 4
Each scale can be set up with the following parameters:
Scale units (lb, lb/kg, lb/ton, lb/tonne, kg, kg/lb, kg/ton, kg/tonne, ton, ton/lb, ton/kg, ton/tonne, tonne, tonne/lb, tonne/kg, tonne/ton and dual units)
Weight Conversion (lb/kg, lb/ton, kg/tonne, ton/tonne)
Zero enable, enable printer only after the weight is returned to zero or less than the enable weight
Motion bandwidth (0.5d 1.0d, 2.0d 3.0d, off)
Division size (0.005 through 50d)
Digital filter (light, medium-light, medium, heavy-medium, heavy, none)
Dual Units
Single range and dual range scale capacity
Calibration time and date stamp
Configuration time and date stamp

Display Rate:

From 0.2 to 10 seconds in 0.1 second intervals (minimum setting of .2 seconds).

Zero:

2% to 100% Zero capability
Can be completely disabled for tank weighing applications
Load cell diagnostics are performed when the zero switch is operated.

Calibration:

Keyboard
Enter cell number, capacity, impedance and sensitivity for each cell in the scale group from the calibration certificates packed with each cell. The resultant span, assuming a good installation and accurate data entered, produces a calibration with +/-0.1%. The final calibration is achieved through front panel trimming using the up/down arrow keys and proper test weights on the platform(s).

Sectional Calibration:

Apply a known weight (concentrated load, i.e., test weights or weight cart) to each section of the scale. Finally apply a calibrated weight to the scale and trim from the instrument keyboard.

Load cell Calibration:

Apply a known weight to each cell in the scale group in the order prescribed by the instrument display, and finally trim to the final value from the instrument keyboard.

Tare: Can be disabled for gross weight only applications.

Keyboard Tare: Tare data can be entered through either keyboard.

Auto tare: Tares can be stored by direct weighing.

Auto clear: Tares can be automatically cleared after printing.

Tare expiration: Tares are time and date stamped to give a warning when their expiration time is over.

Stored Tares:
100 stored tares
1 to 15 alphanumeric character ID
Time and date stamped
Weight data automatically converted to the appropriate weighing units
Tare data files can be listed to a printer or viewed directly from the instrument.

Products:
50 Product files
1 to 15 alphanumeric character ID
Weight accumulator
Conversion factor (1)
Number of decimal places for conversion factor
1 to 15 alphanumeric conversion factor legend
Product data can be programmed to be entered in an inbound, outbound or Gross Tare Net operation
Product data files can be listed to a printer or viewed directly from the instrument.

Field Names:
7 Field names can be given a 15 alphanumeric name to denote driver name, product grade, site location, etc.
Each field name can be programmed to be entered in an inbound, outbound or Gross Tare Net operation
The first field name is stored as part of the transaction file.

Incomplete:
900 Incomplete record storage
Transaction records are stored temporarily as incomplete records
Incomplete data files can be listed to a printer or viewed directly from the instrument.

Transactions: 900 transaction records, each record consists of:

Inbound time	(12 hour am/pm format, 24 hour format)
Outbound time	(12 hour am/pm format, 24 hour format)
Outbound date	(month:dd, mm:dd, dd:month, dd:mm format)
Outbound year	(yyyy, or yy)
Gross weight	
Tare weight	
Net weight	
Product ID	(15 Alphanumeric character ID)
Conversion factor	
Conversion legend	(15 Alphanumeric character ID)
Loop ID	(15 Alphanumeric character ID)
1st Field Name	(15 Alphanumeric character ID)
Ticket number	

Reports:

Two transaction reports can be field programmed to generate any or all portions of a transaction record and in a prioritized order.
Numeric data in the transaction record can be filtered against a search field so that data in the record is only selected if it is less than, equal to or greater than the search field.
Similarly alphanumeric identification fields can be compared to a text search field.
A wildcard command "*" is used to generate grouped reports
For example, if a wildcard string is used in the product search field, all transaction data relating to the first product is generated, then the second and so on for all transaction records
Similarly, a grouped Loop ID report can be generated.

D. Computer Interface Specifications

Continuous: Weight data is continuously transmitted at each display update cycle.

Demand: Data for the communication channel is transmitted in its formatted order whenever a carriage return is received from a computer (PC) or terminal.

Auto: Formatted data is transmitted following a keyboard print command.

Tare & Product File Data: Tare and product file data can be downloaded or uploaded from a computer. The file data is expected in a quote, comma delimited format and is compatible to spreadsheet and data base file formats.

Transaction: Transaction records can be downloaded to a computer (PC) and are compatible to spreadsheet and data file formats. Transaction file data can also be cleared by a command from the computer.

Calibration & Configuration: Calibration and configuration data downloaded to or uploaded from a computer for long term storage and diagnostics.

Modem: As well as connecting directly through cable to a computer, provision is made to link via modem to a remote Intalogix and computer terminal. The call must be initiated at the computer terminal.

SECTION 2:
Installation

A. Typical Installation

A typical installation may be a full electronic (FE) truck scale using 1 com port for a ticket printer and another for a remote display. In every installation, detailed records of the load cell numbers, section numbers and scale numbers must be kept. Mark each load cell calibration certificate with the location (cell number) where that cell is installed. This is a **MUST** in order to properly calibrate the Intalogix™ system.

Mount sectional controller (SC) boxes where they are protected, are accessible, and are within reach of load cell cables.
Mount the power supplies (PS) where they are protected, are accessible, and close to a dedicated ground rod.

Use diagram 2904 page 14, or Appendix VII for wiring of sectional controllers and power supplies. Appendix X shows typical installations for a single F.E.M.T.S. , an IN/OUT two (2) F.E.M.T.S. truck scale installation, and a F.E.M.T.S. three (3) scale highway system.

B. Dip Switch Setup

In each of the sectional controller boxes there is an 8 position dip switch, labeled S1. This switch is used to identify the section in a binary code. The switches **MUST** be set properly for the scale to operate.

SWITCHES 1, 2, AND 3 ARE ALWAYS OFF.

DO NOT CHANGE THESE SWITCH SETTING.

Switches 4 through 8 are used to set the section (section address) numbers. Set the section number according to the following chart.

SECTION NUMBER	SWITCH SETTINGS				
	4	**5**	**6**	**7**	**8**
1	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF
5	ON	OFF	ON	OFF	OFF
6	OFF	ON	ON	OFF	OFF
7	ON	ON	ON	OFF	OFF
8	OFF	OFF	OFF	ON	OFF
9	ON	OFF	OFF	ON	OFF
10	OFF	ON	OFF	ON	OFF
11	ON	ON	OFF	ON	OFF
12	OFF	OFF	ON	ON	OFF
13	ON	OFF	ON	ON	OFF
14	OFF	ON	ON	ON	OFF
15	ON	ON	ON	ON	OFF
16	OFF	OFF	OFF	OFF	ON

Continue in this manner until each sectional controller box has a unique section number entered on the dip switches.

Warning: Leave LINK in position 2, 3mV in ALL cases.

C. Wiring Instructions:

To insure adequate power to the system, the wiring between the indicator and the power supply, and from the power supply to the sectional controller boxes MUST be made with standard 18 gage, 3-pair cable, part number 17204 (old style), or 17246 (new style).

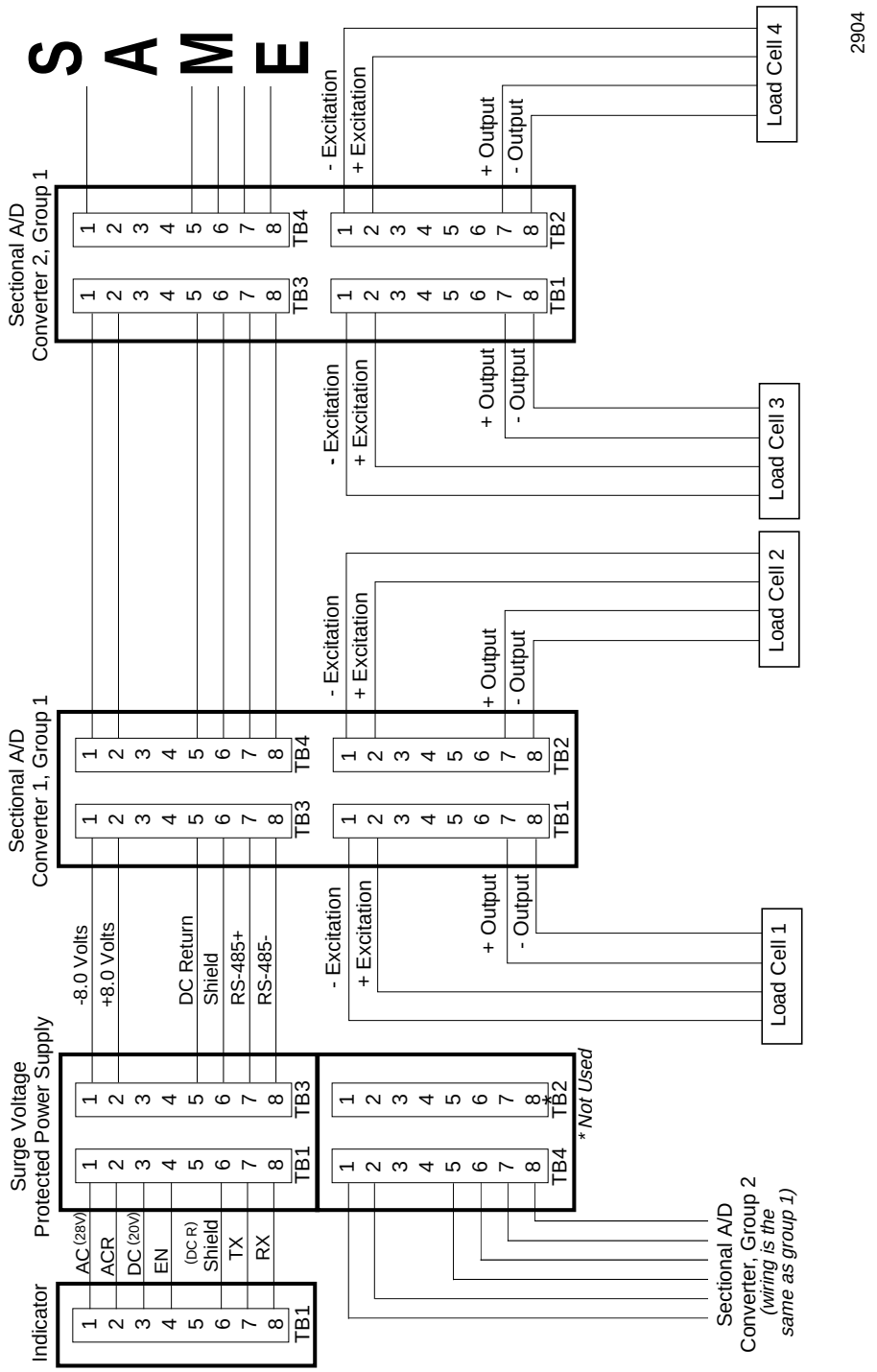
Note: You MUST use correct cable. Improper wire type or size is NOT a warranty issue.

1. Maximum cable lengths are:

NUMBER OF LOAD CELLS	MAXIMUM LENGTH OF CABLE FROM INDICATOR TO POWER SUPPLY
10 - 700 Ohm cells	1800 feet
12 - 700 Ohm cells	1150 feet
14 - 700 Ohm cells	800 feet
16 - 700 Ohm cells	575 feet
6 - 350 Ohm cells	1575 feet
8 - 350 Ohm cells	1000 feet
10 - 350 Ohm cells	575 feet

2. Wiring overview:

The indicator, power supply 15236 and the sectional controllers 15235 are wired in the following manner:



a. For SC 1, bring the load cell cables for the two load cells to be wired into the area where the box is mounted. The ODD numbered cell will always go to TB1 (ODD numbered TB). The EVEN numbered cell will always go to TB2 (EVEN numbered TB). Wire cells according to the following:

3. Load Cell Connections:

Terminal Number	Load Cell Wire
1	- Excitation
2	+ Excitation
6	Shield
7	+ Signal
8	- Signal

Follow this wiring for all cells to all SCs.

a.) If you are mounting the power supply in or near the center (not at the end) of a scale: Wire the sectional controllers on 1 end per drawing 2904, then the controllers on the other end. Run cables from the 2 center SCs TB3(s), to the power supply at TB3 and TB4 (Both TB's are operable). TB1 of the power supply wires to TB1 of the instrument.

b.) If you are mounting the power supply at the end of a scale: Wire all sectional controllers per drawing 2904, then wire the last sectional controller into TB3 of the power supply. TB1 of the power supply wires to TB1 of the instrument.

4. SC Connections:

Terminal Number	17204 Cable	17246 Cable	Description
1	Red of the Black-Red Pair	Black	- 8.0 volts
2	Black of the Black-Red Pair	Green	+ 8.0 volts
5	Green of Black-Green Pair	Blue	DC Return
6	Shield	Shield	
7	White of the Black-White Pair	White	RS-485 +
8	Black of the Black-White Pair	Red	RS-485 -

NOTE: On the 17204 cable, cut away the Black wire in the GREEN-BLACK pair. On the 17246 cable, cut away the Orange wire.

e. Install the power supply, near a dedicated ground rod, in a protected area under the platform where the "Home Run" cable is to be run.

f. Run a cable from the power supply TB1 to the scale house.

g. Secure ALL gland bushing nuts with pliers so that they are "very" tight to prevent contaminents from entering the box.

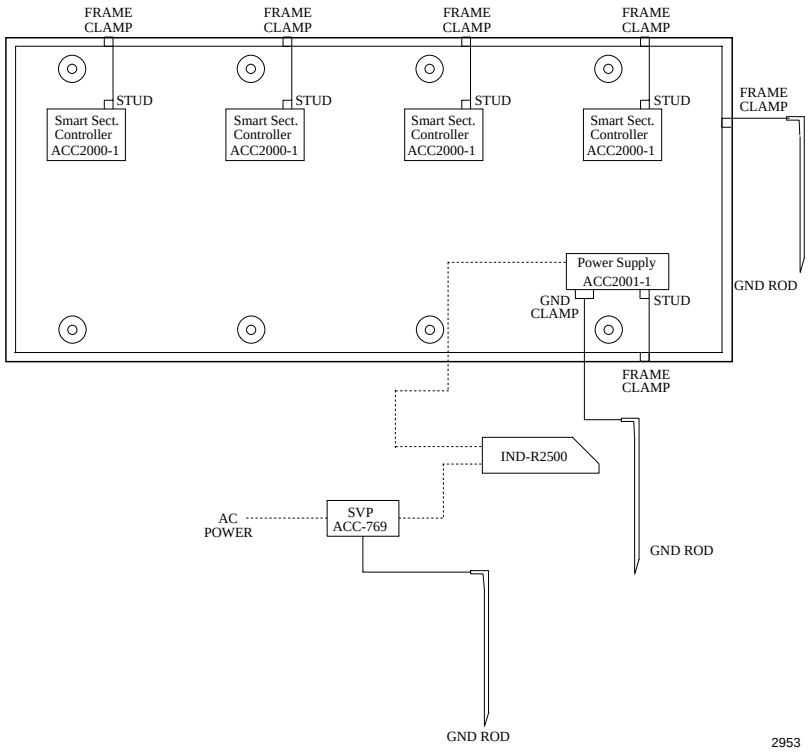
5. Three Platform Highway System:

On systems with long cable runs or with 350 ohm load cells, or systems with more than 16 load cells, a (DF) instrument and 2 power supplies are required. The STEERING AXLE platform and the DRIVE AXLE platform would be wired into TB3 of the 1st power supply, the TANDEM AXLE platform would be wired into TB3 of the 2nd power supply. The two power supplies would be linked via standard cable, TB2 to TB2. Either power supply would be wired to the instrument, TB1 to TB1. See Appendix X.

6. Grounding:

For accurate operation and protection against damage from lightning strikes, all of the components of the Intalogix™ technology system must be properly grounded. There are three (3) different grounding points that are electrically isolated from each other. The following steps must be taken to correctly ground the system.

a. It is recommended that the grounding be done with #8 or larger wire or braided ground straps.
b. All of the ground connections should be 2 feet or less.
c. The grounding studs on the backs of the sectional converter boxes and power supply box must be attached in a clean electrical connection to the platform frame. This may be done with the box mounting brackets if the brackets are bolted directly to the platform frame.
d. The copper ground lug on the power supply is connected directly to a separate ground rod via an isolated and insulated wire.
e. The platform frame (steel), 11341 surge voltage protected outlet box, and the 15235 power supply are to be connected to three (3) DIFFERENT ground rods.



7. Wiring the Indicator

a. Bring the cable end into the power supply box at TB1.
b. Dress the cable end, connect the cable to TB1 USING THE SAME COLOR CODE. Tighten the gland nut VERY SECURELY.
c. Bring the other end of the cable into the back of the indicator through the gland nut. Dress the end of the cable and connect the wires to TB1 near the back of the communications PC board.

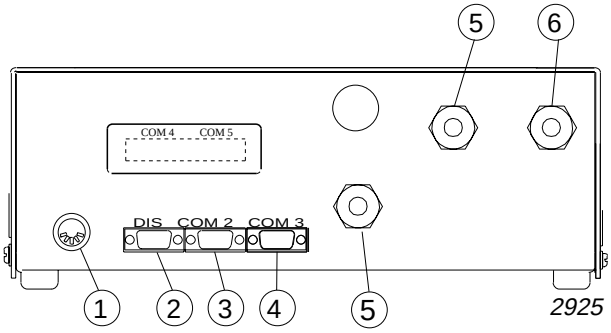
Indicator TB1 to Power Supply TB1	17204 Cable	17246 Cable	Description
Terminal 1	Red of the Black-Red Pair	Black	28 volts AC (AC)
Terminal 2	Black of the Black-Red Pair	Green	AC Return (ACR)
Terminal 3	Green of Black-Green Pair	Blue	20 volts DC (DC)
Terminal 4	Black of Black-Green Pair	Orange	Enable Transmit (EN)
Terminal 6	Shield	Shield	*Shield / DC Return
Terminal 7	White of the Black-White Pair	White	Transmit (TX)
Terminal 8	Black of the Black-White Pair	Red	Receive (RX)

*Shields must be connected or system will not communicate.

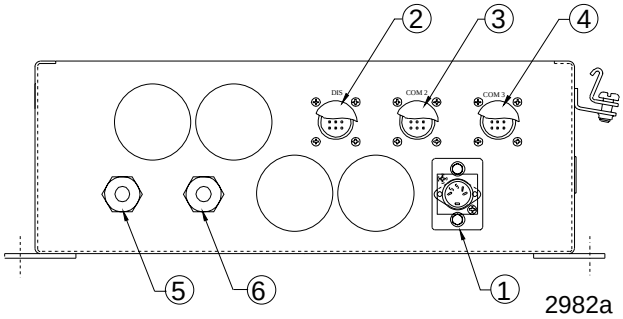
D. Instrument Installation:

1. Instrument Basics:

Back of the IND-R2500-F1 Indicator



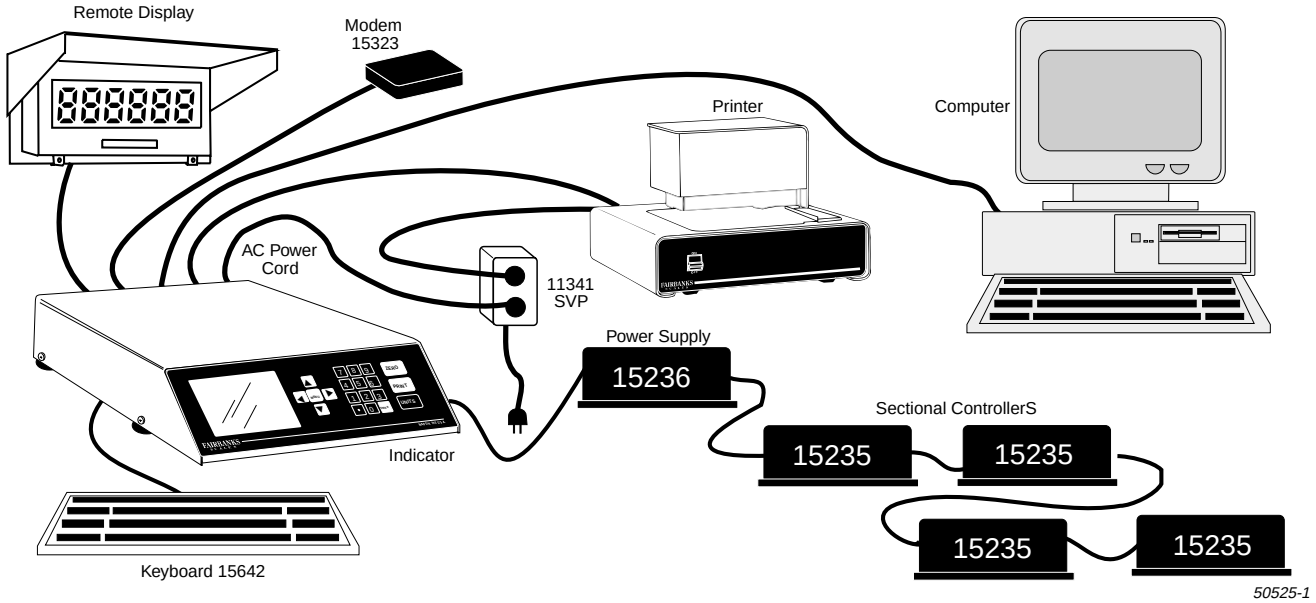
Bottom of the IND-HR2500-F1



1. Keyboard
2. DIS Port - Output to remote display, 20mA current loop
3. COM2 Port - RS232 Output. If accessory 15323 is used, this port is dedicated to the modem. Otherwise, it can be configured for a computer or printer.
4. COM3 Port - RS232 Output. Can be configured for a computer or printer.
5. Liquid tight gland for the 15235 power supply cable
6. AC power cord

NOTE - FOR IND-R2500-1 ONLY

If more communications ports are needed, install the I/O Expansion Accessory 15341. This will make available communications ports, COM4 and COM5.
(COM4 may be configured for RS232 Output or RS485 Output.)

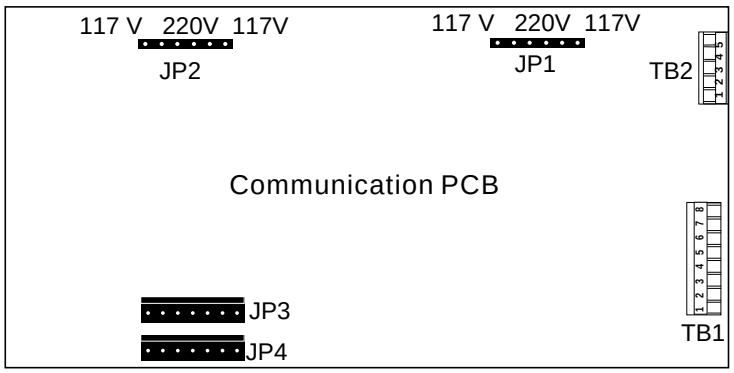


2. 220 Volt Option

The IND-R2500 indicator will operate on 117 volts AC or 220 volts AC. The indicator is shipped from the factory configured for 117 volt operation. The 220 volt option is implemented by changing the jumpers at JP1 and JP2 on the communications board.

To change the input voltage:

a. **REMOVE POWER** from indicator, and open the indicator. Locate JP1 and JP2 on the communications board, beside the two transformers.
b. Two jumpers will be in place on the terminal strip, one jumper on pins 1 and 2, and the second jumper on pins 5 and 6. Remove both jumpers. Then place one jumper on pins 3 and 4. The second jumper is not used.
c. Repeat the process at JP2.
d. Replace the plug on the end of the AC power cord with a 220 volt plug.
e. Mark correct voltage on serial tag.



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3. Instrument Setup:

Steps for a proper installation for a IND-(H)R2500-X to a F.E.M.T.S.

a. Complete the physical installation of all equipment.
b. Make sure ALL CELLS are FOUND on the power-up screen.
c. CLEAR MEMORY before setting parameters.

NOTE: Initial Step MUST DO BEFORE PROGRAMMING INSTRUMENT

1. Select Menu
2. Select Service Menu
3. Select Special Functions
4. Select Clear All Memory
5. Press ENTER
6. Program indicator as required

d. Set the OPERATING MODE, DISPLAY CONTRAST, AUDIBLE ALARM, and NUMBER of SCALES.
e. Set all parameters in the CALIBRATION MENU down to CALIBRATION WEIGHT for all scales.

NOTE: DO NOT USE CALIBRATION WEIGHT.

f. Set CELL SENSITIVITY, RESISTANCE (use calibration data sheets packed with each cell) and CALIBRATE (platform[s] unloaded) for each cell in all scales.
g. Go to TRIM, CELL/SECTION/SCALE and select each CELL. TRIM CELL to be certain that all cells start at zero (00) before proceeding.
h. Place a load (2000 lb minimum on a 50k cell) directly over each cell and trim that cell to the test load. Repeat this for ALL CELLS in the system.
i. Go to TRIM, CELL/SECTIONS/SCALE and select each SECTION. TRIM SECTIONS to be certain all sections are starting at zero (00) before proceeding.
j. Place a concentrated load (test cart) directly over each section and trim that section to the test load. Repeat this for ALL SECTIONS in the system.
k. Go to TRIM, CELL/SECTIONS/SCALE and select TRIM SCALE to be certain that the scale is starting at zero (00) before proceeding.
l. Place known test weights (in amount required by Weights & measures to place scale in service) and trim to the exact known weight value.

Note: At this point, the scale is calibrated.

m. Go to SPECIAL FUNCTIONS and select "RESET SECTION PEAKS" and press ENTER to reset.
n. If a 50-3921 or OKI 320/520 is available, select an available com port and install and program the instrument and printer for operation.
o. Continue with the installation & setup of any peripheral equipment (printers, remote displays, etc.) and all other functions the customer requires.
p. After the instrument and peripheral setup is correct and complete, print (3) copies of the CALIBRATION REPORT from the SERVICE MENU. One copy for the shop, one for the customer, and a copy for your records.

Note: If a form printer is NOT available, write down all formats, calibration and parameter information and distribute copies as noted above.

q. Instruct the customer/user on proper operation of his scale. Quote a Service Agreement to keep all equipment in proper operating condition and adjustment.

SECTION 3:
PASSWORDS / SECURITY CODE

A. Introduction

Two separate passwords are available for restricting access to both the CONFIGURATION MENU, and SERVICE MENU.

NOTE: Once the security code [password] has been entered for the SERVICE MENU, it will override the other password, making all features available for the service technician. Both will be re-enabled when the instrument is returned to the weigh screen.

B. Instructions for INSTRUMENT TOUCH KEYPAD ONLY.

1. For Features OTHER THAN SERVICE:

    a. From the weighing screen press and release the "<" key, the ">" key, and the "ENTER" key.
    (If the keyboard accessory is attached, the touch keypad method may NOT work).
    b. The display will show, "ENTER SECURITY CODE."
    c. Key in the security code (up to 15 digits) and press "ENTER."
    d. The display will show "SECURITY CODE ACCEPTED."

2. For SERVICE MENU:

    a. From the weighing screen press "MENU" to access the OPERATION MENU.
    b. Place the cursor next to the "SERVICE" legend.
    c. Press and release the "<" key, the ">" key, and the "ENTER" key.
    (If the keyboard accessory is attached, the touch keypad method may NOT work).
    d. The display will show, "ENTER SECURITY CODE."
    e. Key in the security code (up to 15 digits) and press "ENTER."
    f. The display will show "SECURITY CODE ACCEPTED."

C. Instructions for the KEYBOARD ACCESSORY ONLY.

1. For All Features OTHER THAN SERVICE:

    a. From the weighing screen press "CONTROL", "ALT", and "ESCAPE" at the **SAME TIME**.
    b. The display will show "ENTER SECURITY CODE."
    c. Key in the security code (up to 15 digits) and press "ENTER."
    d. The display will show "SECURITY CODE ACCEPTED."

2. For SERVICE MENU:

a. From the weighing screen press the "MENU" key to access the OPERATION MENU.
b. Place the cursor next to the "SERVICE" legend.
c. Press "CONTROL", "ALT", and "ESCAPE" at the SAME TIME.
d. The display will show "ENTER SECURITY CODE."
e. Key in the security code (up to 15 digits) and press "ENTER."
f. The display will show "SECURITY CODE ACCEPTED."

D. Deleting Passwords (Requires Keyboard 15642)

1. For All Features Other Than Service:

a. From the weighing screen press "CONTROL", "ALT", and "ESCAPE" at the SAME TIME.
b. The display will show "ENTER SECURITY CODE".
c. Press the "DELETE" key.
d. The display will show "SECURITY CODE ACCEPTED."

2. For SERVICE MENU:

a. From the weighing screen press the "MENU" key to access the OPERATION MENU.
b. Place the cursor next to the "SERVICE" legend.
c. Press "CONTROL", "ALT", and "ESCAPE" at the SAME TIME.
d. The display will show "ENTER SECURITY CODE."
e. Press the "DELETE" key.
f. The display will show "SECURITY CODE ACCEPTED."

SECTION 4:
Programming

General Programming Instructions:

There are three main programming menus that contain all of the parameters for the system.

Operators Menu - Accessible without a password by pressing the MENU key. This menu is used for general weighing operations and access to the Modem Service Menu. (This will be protected with the same password as the Configuration Menu. This menu is used to program and operate the modem service feature).

Configuration Menu - May be protected with a password. This menu is used to set up the parameters for the Field Names, products, IDs, Titles, display contrast, audible alarms, and outputs.

Service Menu - Must be protected with a password. This menu is used to set up the technical parameters of the system, such as scale capacity, span, and load cell data.

Note: It is recommended that a keyboard be part of the system so that data may be entered in both alpha and numeric formats. Use keyboard 15642.

Getting Started:

The following instructions apply to all of the menus:

1. In all menus, the UP or DOWN arrows move the cursor in the indicated direction.

2. To make an entry, place the cursor beside the item to be selected and press the ENTER key. The operator will be prompted for the data to be entered.

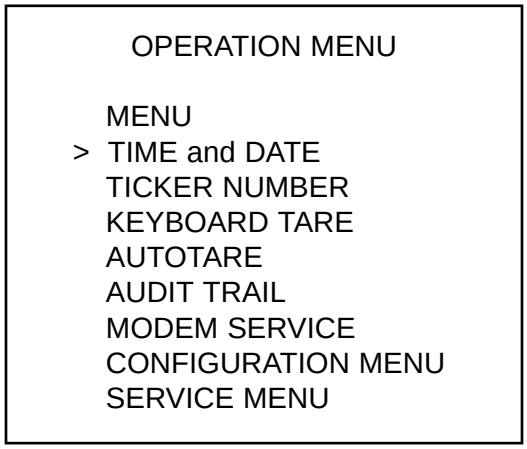
3. A "key" symbol beside a menu item means the item is "locked" and can only be accessed with a password.

4. Data may be entered through the keypad or optional keyboard 15642.

5. When the appropriate data has been entered, press the ENTER key to record the data into memory or accept the data entered.

A. Operation Menu

To enter the Operation Menu, from the weigh screen press MENU. The items in the OPERATION MENU may be set or re-set at any time through the keypad or optional keyboard, except those items that are "locked" by a password.



1. **Time And Date**
   The time and the date may be entered in a variety of formats.

<MENU>	Returns to the Operation Menu
SET TIME	Enter the time in any format.
SET AM	If the time was entered in the standard format, select AM,or
SET PM	PM, whichever is appropriate
SET DATE	Enter the date in any format.
TIME FORMAT	The options are hh:mm, am/pm or hh:mm (24 hour time).
DATE FORMAT	The options are Month-dd, dd:mm, dd-Month, mm:dd
YEAR FORMAT	The options are yy or yyyy.

The time and date that were entered will be converted to the format selected.

Note: At the bottom of the Time and Date selection, the software revision and date will be shown.

2. **Ticket Number**
   Enter the number to appear on the next ticket to be printed out.

3. **Keyboard Tare**
   Enter the LOOP ID and then the TARE WEIGHT for the container. If a password has been entered and an entry is made, it cannot be changed by the operator in the OPERATION MENU. Changes can be made through the CONFIGURATION MENU.

Note: KEYBOARD TARE and AUTOTARE operate the same in both the OPERATION and CONFIGURATION MENUS. Data can be entered from either one, UNLESS a configuration password is entered.

4. **Autotare**
   Enter the TARE ID and the TARE WEIGHT will be entered automatically when the container is placed on the scale. If a password has been entered and an entry is made, it cannot be changed by the operator in the OPERATION MENU. Changes can be made through the CONFIGURATION MENU.

5. **Audit Trail**
   When Audit Trail is selected, the audit information will be displayed for calibration and configuration. The "count" is a random number that is updated by 1 each time the particular menu is accessed. This display shows the time and date when the calibration or configuration programs were changed. The first column is the number of the platform, followed by the time and date the change was made. To select, press the ENTER key.

6. **Modem Service**
   To select, press the ENTER key. If locked, enter the CONFIGURATION PASSWORD to enter modem service. This selection is used to operate the modem service link. This option requires that Modem Accessory 15323 and cable accessory 15457 be installed. See publication 50167 for information on the Modem Operation. When this option is selected, the display will show:

   a. **OPERATION MENU -** This selection returns the display to the OPERATIONS MENU.
   b. **INITIALIZE MODEM -** This selection sets the transmission parameters for COM 2 to the default settings. These settings will match the parameters of the receiving modem.
   c. **BAUD SELECT (COM 2) -** This selection will display the parameters selected for COM2 Port.

   DO NOT CHANGE THESE SETTINGS.
   These are the settings needed to operate Accessory 15323.
   If another modem is used, consult the modem manual for the proper settings.

   d. **TELEPHONE* -** This selection is used to choose the type of phone system, TONE or PULSE.
   e. **DIAL* -** This selection is used to enter the phone number to be dialed. When ENTER is pressed, the displayed number will be dialed.
   DISABLED ON standard product.
   f. **REDIAL* -** This selection redials the number entered in Step 5, DIAL. (See above note)
   g. **HANGUP* -** This selection is used to break the telephone connection.

Note: The computer or remote modem should always dial INTO the 2500 instrument.

   h. **COM PORT ENABLED - YES or NO -** Enables or disables Com Port 2 as the modem output port. If disabled, Com Port 2 can be used for another function. MUST be enabled to communicate on modem.
   i. **MODEM COMMAND -** When the transmission begins, this line will change to reverse display and a series of messages about what is being transmitted will appear.

j. **CARRIER OFF -** When the telephone connection is complete, this display will change to CARRIER ON. This message will be displayed until the connection is broken.

7. **Configuration Menu**
   To select, press the ENTER key. If locked, enter the CONFIGURATION PASSWORD to enter the Configuration Menu. See Configuration Menu, Section 4, B.

8. **Service Menu**
   To select, press the ENTER key. If locked, enter the SERVICE PASSWORD to enter the Service Menu. See Service Menu, Section 4, C.

B. CONFIGURATION MENU

To enter the CONFIGURATION MENU, place the cursor beside the legend and press the ENTER key. The operator will be prompted for a PASSWORD if one has been installed. Enter the password and press the **ENTER** key.
The display will show:

```
CONFIGURATION MENU

  OPERATION MENU
> KEYBOARD TARE
  AUTOTARE
  SELECT SCALE
  TITLE
  FIELD NAMES
  PRODUCT IS
  PRODUCT PROMPT
  REPORTS
  DISPLAY CONTRAST
  AUDIBLE ALARM OFF
  LOAD CELL DIAGNOSTICS
  4 to 20mA SETUP
  COMMUNICATION PORT
```

1. **OPERATION MENU**
   Select this option to return to the OPERATION MENU.

2. **KEYBOARD TARE**
   Enter the LOOP ID and then the TARE WEIGHT to be used with the entered LOOP ID.

   Note: KEYBOARD TARE and AUTOTARE operate the same in both the OPERATION and CONFIGURATION MENUS. Data can be entered from either one, <u>UNLESS</u> password is entered.

3. **AUTOTARE**
   Place the container on the scale and press the ENTER key. Enter the LOOP ID.

4. **SELECT SCALE**
   If there are two (or more) platforms connected to the indicator, this selects the platform that will be used as the "INBOUND SCALE" and the "OUTBOUND SCALE". A third option can be used, "SELECT SCALE YES or “NO." "YES" allows the operator to select the scale to be used while in the Main Menu.

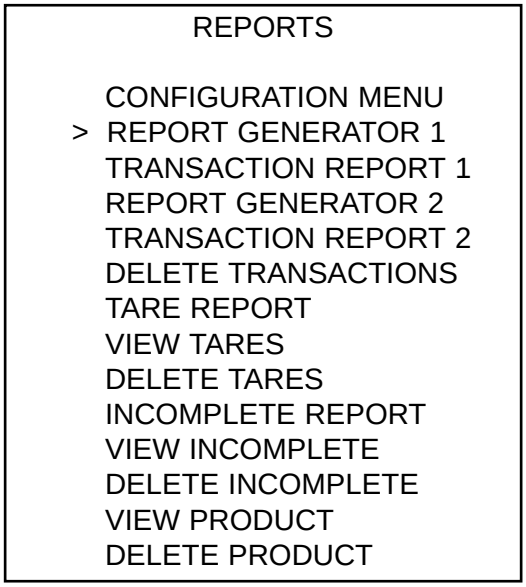
5. **TITLE**
   This selection is used to enter Header information, such as customer name and address. There are 5 lines available with 31 characters per line.

6. **FIELD NAMES**
   This selection is used to describe the information to be put into a field, 15 characters per line, with 7 available lines, and prompt for each line. The prompts are "GTN," "IN," "and "OUT." Each prompt can be toggled ON or OFF. Only Field Name #1 is stored and available for reporting.

7. **PRODUCT ID**
   Enter the code that will identify the product, letters or digits, up to 15 characters.

8. **PRODUCT PROMPT**
   Enables or disables product prompts in the GTN, Inbound or Outbound menus.

9. **REPORTS**
   Select to print, review, and delete reports.



   a. **CONFIGURATION MENU** returns the screen to the configuration menu.
   b. **REPORT GENERATOR** 1 through TRANSACTION REPORT 2 are explained in the following pages.

Two (2) custom reports are available in each 2500 series instrument. They are designed to be quickly and easily programmed to suit the customers requirements. Each available report has two parts, the REPORT GENERATOR, and the TRANSACTION REPORT. The report generator is used to design the report, and the transaction report is used to print it.

HOW DO YOU DESIGN A REPORT?

To design a report two things must be remembered, Priority and Search Field.

PRIORITY

There are twenty-one (21) possible pieces of information stored in the transaction record to select from for reporting. Depending on Operating Mode set, this data may appear differently. A common IN/OUT mode will produce:

- Time IN
- Time OUT
- Date
- Inbound Weight
- Outbound Weight
- Net Weight
- Product ID
- Conversion Factor 1
- Loop ID
- Field Name 1
- Ticket #
- Alt Gross
- Alt Tare
- Alt Net

To include a piece of information in the report it must be given a priority.

Example: Think of your phone bill. It includes columns of information such as; time, date, location called, minutes of call and charge for call. These columns of information are in a specific order (or priority) from left to right. Simply put, priority is the column in which you want the selected information to be printed. Your first column will have a priority of one (1), your second column will have a priority of two (2) and so forth. It you do not want a piece of information on the report, assign it a priority of 0, and it will not be included on the report. (See example 1).

Example 1: Priorities

Date	Truck ID	Product ID	Net Weight
1-01-98	4423	1429	42300
1-01-98	2342	1323	36880
1-02-98	3210	1456	45680
1-02-98	3315	1429	38420
1-03-98	2388	1456	40240
1-03-98	4423	1429	39080
1-03-98	3412	1323	40100
1-03-98	2893	1456	36460
Number of Transactions 8		319160 Lbs Total Net Weight	

Search Fields: Search Fields allow you to get very specific about the information you need on your report. For example, if you need a report specifically on product 1456, give the Product ID field a priority and in the Search Field for Product ID enter the ID to search for, in this example 1456. When printed, the report will only contain transaction information for transactions which included product 1456. Transactions which included any other Product ID will not be included. Additionally, multiple search fields can be used. A search could be done for a specific Product ID, Customer ID, Truck ID and Date. Only the transactions that met all of the search criteria will be included on the report. Transactions which only met three of the four would not be included. See example 2.

Example 2: 1456 has been entered in the Product ID Search Field.

Transaction Report 8:22 AM 5-07-98 Page 1

Date	Truck ID	Product ID	Net Weight
1-02-98	3210	1456	45680
1-03-98	2388	1456	40240
1-03-98	2893	1456	36460

Number of Transactions 3 122380 Lbs Total Net Weight

For more extensive reporting, a wild card can be used in the search field. This wild card is an asterisk, (*****). Using the wild card in the search field will group items together by ID. See example 3.

Example 3: Using Wild Card in Product ID Search Field

Transaction Report 8:22 AM 5-07-98 Page 1

Date	Truck ID	Product ID	Net Weight
1-01-98	4423	1429	42300
1-02-98	3315	1429	38420
1-03-98	4423	1429	39080

Number of Transactions 3 119800 Lbs Total Net Weight

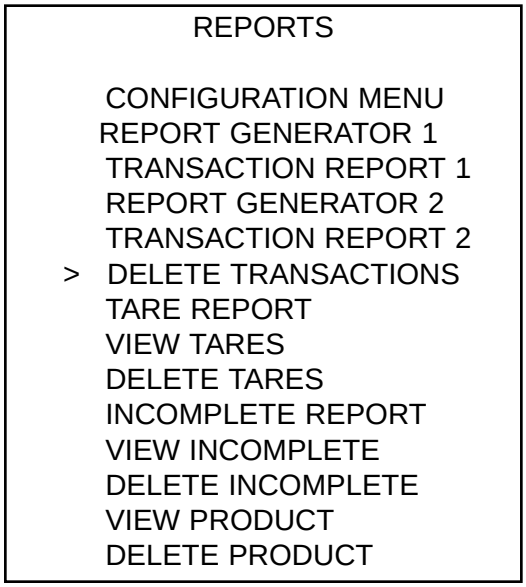
1-02-98	3210	1456	45680
1-03-98	2388	1456	40240
1-03-98	2893	1456	36460

Number of Transactions 3 122380 Lbs Total Net Weight

1-01-98	2342	1323	36880
1-03-98	3412	1323	40100

Number of Transactions 2 319160 Lbs Total Net Weight

At the end of the transaction report the operator will be prompted to delete all transaction file data. The ENTER key will delete, any other key will exit without deleting.



c. **DELETE TRANSACTIONS-** Will clear storage of transactions
d. **TARE REPORT-** Will list all stored tares
e. **DELETE TARES-** Will erase stored tares
f. **INCOMPLETE REPORT-** Will list transactions started, that have NOT been completed
g. **VIEW INCOMPLETE-** Will allow viewing of incomplete transactions
h. **DELETE INCOMPLETE**- Will erase incompletes from record
i. **VIEW PRODUCT-** Will allow products to be checked, edited
j. **DELETE PRODUCT**- Clears record of products

10. **DISPLAY CONTRAST**
Select to change the contrast between the displayed text and the background. Use the UP and DOWN arrows to make the change.

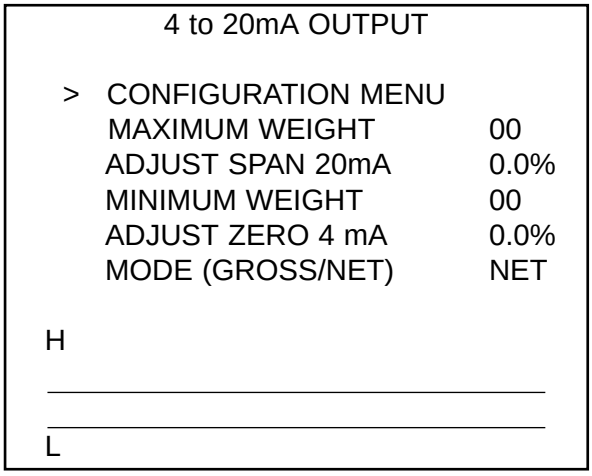
11. **AUDIBLE ALARM**
With the alarm ON, the indicator will "BEEP" when a key is pressed on the keypad. Press the ENTER key to toggle the alarm ON or OFF.

12. **LOAD CELL DIAGNOSTICS**
Displays a cell number and a legend, "GOOD" or "BAD" for each load cell in the system.

13. **4-20 mA SETUP**
Used to configure the 4 to 20 mA output.

Note: The 4-20mA can only be used if the expansion kit 15341 has been installed.

This menu is used to set the output parameters for the 4-20 mA circuits. When this is selected from the CONFIGURATION MENU, the display will show:



To configure the 4-20 mA Output, connect a milliammeter to PINS 1 and 2 on the 4-20 analog output board. The pins are located on the TB1 connector. Pin 1 is "+" and Pin 2 is "-".

a. **CONFIGURATION MENU -** This selection returns the display to the CONFIGURATION MENU.
b. MAXIMUM WEIGHT - Enter the weight at which the 4-20 mA output will be at 20 mA.
c. **ADJUST SPAN 20 mA** - With the milliammeter connected to pins 1 and 2, and the cursor beside this option, press the ENTER key. While watching the meter, press either the UP or the DOWN arrow, until the meter reads 20.00mA.
d. **MINIMUM WEIGHT** - Enter the weight at which the 4-20 mA output will be at 4 mA.
e. **ADJUST ZERO 4mA** - With the milliammeter connected to pins 1 and 2, and the cursor beside this option, press the ENTER key. While watching the meter, press either the UP or the DOWN arrow, until the meter reads 4.00mA.
f. **MODE (GROSS/NET)** - Enter the mode, GROSS or NET, that the 4-20 mA output will track.

14. **COMMUNICATIONS PORTS**

This selection is used to configure communication ports 2 and 3. When this option is selected, the display will show:

```
COMPORT 2

   CONFIGURATION MENU
>  COMPORT
   DEVICES
   DEFAULT FORMAT
   INBOUND FORMAT
   OUTBOUND FORMAT
   GROSS*TARE*NET FORMAT
   BAUD SELECTION
   INVERSE PRINT
   ENLARGED CHARACTERS
   FORM SIZE
   REMOTE DISPLAY
```

a. **CONFIGURATION MENU -** When this item is selected, the display returns to the CONFIGURATION MENU.

b. **COM PORT** - This is used to select the communications port to be configured, 2, 3, 4 or 5. Only COM2 and COM3 are valid choices, unless accessory 15341 has been installed.

c. **DEVICES -** This selection is used to turn the communications port, designated in Step 3, OFF or to select the device to be used, such as a printer or computer.

When Devices is selected from the Communications Port Menu, the screen will show:

```
COMPORT 2 OFF

   COMMUNICATIONS MENU
>  COM PORT 2 OFF              OFF
   CTS RTS CONTROL NO
   TICKET PRINTER 50-3925
   TICKET PRINTER 50-3960
   TICKET PRINTER 50-3950
   TICKET PRINTER SP 2000
   TICKET PRINTER PTR-610
   TAPE PRINTER 50-3715
   FORM PRINTER 50-3921
   FORM PRINTER OKI 320/520
   CUSTOM DRIVER
   COMPUTER ( PC)
```

1). To select the device, place the cursor beside the appropriate choice and press the ENTER key. If "COM PORT 2 OFF" is selected, the communications port will be turned OFF. Any other choice will automatically turn the port ON.
2). If **"CTS RTS CONTROL"** is selected, pressing the ENTER key will toggle the selection between YES and NO.
3). If a printer is to be selected, place the cursor beside the appropriate choice and press the ENTER key. The selected printer legend will appear at the top of the menu.
4). **CUSTOM DRIVER** can be set to operate devices that are NOT included in the menu of Devices. The manual for that new device should be used for entering control codes that will cause the device to perform as needed.

```
        CUSTOM DRIVER

  >  MENU
     TICKET INITIALIZATION

     CHARACTER SIZE

     DOUBLE WIDTH

     LINE FEED

     FORM FEED

     REPORT INITIALIZATION
```

a). **MENU** - Returns to the previous screen
b). **TICKET INITIALIZATION** - The Reset, Line Spacing, and Form Length codes
c). **CHARACTER SIZE** - CPI, enhanced (bold) print characteristics
d). **DOUBLE WIDTH** - Enlarged characters
e). **LINE FEED** - The code(s) that effects a LF
f). **FORM FEED** - The code(s) that effect a FF
g). **REPORT INITIALIZATION** - full page print setup; Lines per Inch, Lines per Page, Quality

5). If **COMPUTER (PC)** is selected the screen will show:

```
   COMPUTER OUTPUT

 <SETUP MENU>
 >CONTINUOUS
   DEMAND
   AUTO
   CHECKSUM              OFF
   POLL CHARACTER        Cr
   START MESSAGE
   BLOCK SEPARATOR       CrLf
   END OF MESSAGE        EOT
```

a). **<SETUP MENU>** - Returns to the COMPUTER as a selected device
b). **CONTINUOUS** -Output data transmission mode, uninitiated & continuous
c). **DEMAND** - Output data transmission mode, occurs when poll character is received
d). **AUTO** - Output data transmission mode, occurs when PRINT is pressed
e). **CHECKSUM** - Character that checks for integrity of transmission (ON or OFF)
f). **POLL CHARACTER** - A character, such as Cr, received to initiate a "send" or transmission
g). **START MESSAGE** - The leading character of the 'send' or transmission
h). **BLOCK SEPARATOR** - The character(s) that separate blocks (strings) of sent data
i). **END OF MESSAGE** - The character(s) that signal the message is complete

d. **DEFAULT FORMAT** - This selection sets the default print parameters and baud selection for the device selected.
e. **INBOUND FORMAT** - This selection is used to customize the locations of the printed information on the inbound part of the ticket or form.
f. **OUTBOUND FORMAT** - This selection is used to customize the locations of the printed information on the outbound part of the ticket or form.
g. **GROSS*TARE*NET FORMAT** - This selection is used to customize the locations of the printed information on the Gross, Tare, Net ticket or form.
h. **BAUD SELECTION** - This selection is used to set the baud rate, parity, data bits, and stops for the selected communications port.
i. **INVERSE PRINT** - This selection allows for the selection of inverted print for the INBOUND, OUTBOUND, or GTN part of the ticket or form.
j. **ENLARGED CHARACTERS** - This selection allows for the selection of large print for the INBOUND, OUTBOUND, or GTN part of the ticket or form.
k. **FORM SIZE** - This selection will prompt the operator to enter the length, in inches, of the ticket that will be printed on an IN-BOUND or OUT-BOUND weighment.
l. **REMOTE DISPLAY** - This selection allows the enabling of a remote display and the selection of what will be displayed.

1). If **"REMOTE DISPLAY OFF"** is selected, connector P3 on the mother board will be disabled. Any other selection will automatically enable connector P3.
2). **Continuous GROSS** tracks and displays weight continuously
3). **GROSS on PRINT** displays the weight as the printer would see it, within motion band setting
4). If **ON** is selected for **"TIME OUTPUT"**, the Remote Display will show the current time when there is no activity on the platform. If OFF is selected, the time will not be displayed.

Note: In the service program, update rates of less than .4 seconds will cause erroneous remote display (lampbank) performance. Use a realistic display update setting.

C. SERVICE MENU

To enter the SERVICE MENU, place the cursor beside the legend and press the ENTER key. The operator will be prompted for a PASSWORD, key in the password and press the ENTER key.

```
          SERVICE MENU
    OPERATION MENU
<   OPERATING MODE
    UPDATE RATE
    ZERO MODE
    TARE MODE
    NUMBER SCALES
    CELL OUTPUT (COUNTS)
    CALIBRATION
    WRITE PASSWORD
    PRINT CALIBRATION REPORT
    SPECIAL FUNCTIONS
```

1. **OPERATION MENU**
   This selection returns the display to the OPERATION MENU.

2. **OPERATING MODE**
   This selection allows the choice using the indicator as a Scale Weight Only/Data Terminal or setting up hardware for fieldbus operation. With the cursor on Scale Weight Only, pressing ENTER will toggle to data terminal then to weight only. With the selection displayed, press MENU to exit and the choice made will be entered into the program.

Caution: **Selecting Fieldbus with an expanded memory I/O board installed will destroy the I/O PCB. This is a specific application setting for Fieldbus only. DO NOT use unless a PLC Interface card is installed.**

3. **UPDATE RATE**
   This selection allows the display update rate to be changed in increments of 0.1 seconds. (**0.2** is the absolute **MINIMUM** setting. **0.4** setting **MINIMUM** for remote display operation).

4. **ZERO MODE**
   This selection allows for the selection of 2% OF CAPACITY or 100% OF CAPACITY, ZERO SWITCH enabled or disabled, PRINT INHIBIT, YES or NO, and ENABLE WEIGHT.

The legend at the top of the screen shows the current setting.
2% or 100% OF CAPACITY - This is the amount of weight that can be "zeroed off" when the ZERO key is pressed. Place the cursor beside the appropriate selection and press the ENTER key. The legend at the top of the screen will change to show the chosen item.

ZERO SWITCH enabled or disabled - The selection enables or disables the ZERO key on the front panel. If "disabled" is selected, the ZERO key will NOT operate. Press the ENTER key to toggle between "ENABLE" or "DISABLE". The legend at the top of the screen will change with each toggle.

PRINT INHIBIT YES or NO - When "YES" is selected, only ONE print per weighment will be allowed and the Enable Weight feature is employed. Select "NO" and the print cycle is in the normal configuration and the Enable Weight feature is not used.

ENABLE WEIGHT - This is the minimum amount of weight that must be on the platform for a weighment to begin. Place the cursor beside this choice and press the ENTER key. Enter the minimum weight through the key pad and press the ENTER key. The entered value will be displayed beside the legend.

5. **TARE MODE**
   This selection is used to:
   a. Enable or Disable tares, select one or the other, cannot select both.
   b. Enable Manual tare IDs
   c. Put the system in the AUTO CLEAR mode for Tares
   d. Set the tare expiration time in days

6. **NUMBER SCALES**
   Enter the number of scale platforms, 1 , 2, 3, or 4 that are in the system.

7. **CELL OUTPUT (COUNTS)**
   When this item is selected, the display will show "Calibration counts" and "Current counts". This display is for information only. Values cannot be changed from this display.

EXAMPLE OF LOAD CELL COUNT VALUE DISPLAY

CELL	CALIBRATION	CURRENT
1	16432	18825
2	16900	17002
3	15310	15378
4	16001	16044

The chart will list all of the cells by number. Cells that the system deems "BAD" will be highlighted. These cells are out of tolerance by approximately 2.5% of the scale capacity.

8. **CALIBRATION**

When this item is selected, the display changes to the CALIBRATION MENU.

```
        CALIBRATION MENU
    SERVICE MENU
>   SCALE ID 1
    SCALE UNITS
    DIVISION SIZE
    MOTION BAND
    AUTO ZERO TRACKING BAND
    FILTER FACTOR
    FIRST CELL ID
    LAST CELL ID
    SCALE CAPACITY
    CALIBRATION WEIGHT
    CELL SENSITIVITY mV/V
    SPAN (SECTIONS)
    TRIM CELL/SECTIONS/SCALE
```

a. **SERVICE MENU** - This selection will return the display to the SERVICE MENU.

b. **SCALE ID X** - The "X" is the number of the scale being calibrated. If there is only one scale, enter "1". If there is more than one scale in the system, the data in the calibration menu will have to be entered FOR EACH SCALE, separately.

c. **SCALE UNITS** - These are the units used to calibrate the scale. This selection will also be the primary units of weight displayed in weighing operations.

d. **DIVISION SIZE** - This selection is used to chose the appropriate division size. If "DUAL RANGE" is selected, enter the smaller division size. The indicator automatically switches to the next higher division size for the higher range.

e. **MOTION BAND** - This option is used to select the number of divisions within the motion band of the platform.

f. **AUTO ZERO TRACKING BAND** - This option is used to select the number of divisions the scale AZT band will automatically rezero before it needs to be manually re-zeroed.

g. **FILTER FACTOR** - This option is used to set the digital filter. The factory default setting is OFF.

h. **FIRST CELL ID** - This is the ID number assigned to the first load cell in the scale. Usually, the number "1" will be assigned to first cell in scale one. In a two scale system, each with 4 load cells, "1" would be assigned the first cell in scale 1 and "5" would be assigned to the first cell in scale 2.

i. **LAST CELL ID** - This is the ID number for the last load cell in the scale. If there is only one scale, this will be the number of the last load cell. If there are two scales in the system, each with 4 cells, the last load cell in scale 1 should be "4" and the last load cell in scale 2 should be "8".

j. **CELL CAPACITY** - This is the rated capacity of the load cells in the scale. This value may be different for two different scales in the same system. Use load cell certificate(s) for this rating.

k. **SCALE CAPACITY** - Enter the rated capacity of the scale being calibrated. If "DUAL RANGE" was selected in item 4, enter the smaller capacity first, and then the larger capacity.

l. **CALIBRATION WEIGHT** - *Enter the weight to be used to calibrate the scale.

m. **CELL SENSITIVITY mV/V** - This option sets the mV/V for each of the load cells. Use the load cell certificate for EACH cell used, in all scales assigned to this instrument.

When this option is selected in the SERVICE MENU,
the display will show:

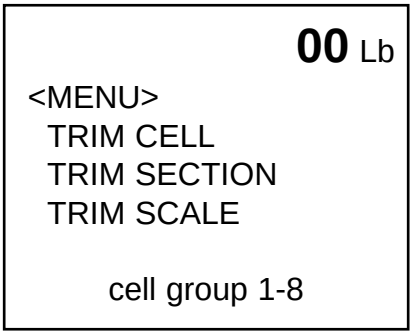
1.) **MENU** - This selection will return the display to the SERVICE MENU.
2.) **CELL X** -This is the number of the cell that is being calibrated. Enter the cell number through the keypad.
3.) **SENSITIVITY 0.0000 mV/V** - This is the cell sensitivity as listed on the cell serial tag or the specification sheet supplied with the cell.
4.) **RESISTANCE Ohms** - This is the cell resistance as listed on the cell serial tag or the specification sheet supplied with the cell.
5.) **CALIBRATE** - When this option is selected, the load cells in the cell group, listed in the bottom line of the display, will be calibrated automatically. Complete all cells in the "Group" before calibrating.
6.) **CELL GROUP 1-4** -This item is automatically determined (First and Last cell entries) and displays the cells that will be calibrated when the ENTER key is pressed in Calibrate (see above).

n. **SPAN (SECTIONS)** - *This option is used to span the scale sections.

This option is used to span the scale by sections. Section 1 is load cells 1 and 2, and Section 2 is load cells 3 and 4, and so forth. Check the sectional controller to determine the load cell numbers. This works with a concentrated load centered on the section. **Do NOT use a test truck for this initial section span,** use a weight cart or concentrated weights only. If more than one scale has been programmed, when this option is selected, the operator will be prompted for a "Scale ID". Enter the scale number and press the ENTER key.

Enter the calibration weight that will be used to span the scale. Then press the ENTER key. Enter the test load if different from the one displayed and press the ENTER key. When the ENTER key is press the display will change to the section numbered as "1". Follow the instructions on the screen and repeat the process for each of the scale sections. * BEFORE calibrating sections, read the calibration sequence.

o. **TRIM, CELL/SECTION/SCALE** - This option is used to trim the scale by cells, sections, or the entire scale. Additional adjustment can be achieved by trimming each of the load cells. At the Calibration Menu, select "TRIM, CELLS/SECTION/SCALE" and press the ENTER key.
The display will show:



1.) The **"XXXXXX"** is the weight on the scale.
2.) **TRIM CELL** - Select this option if the scale is to be trimmed by load cells. When this item is selected, the operator will be asked for the number of the load cell to be trimmed. Enter the number and press ENTER.
3.) **TRIM SECTION** - Select this option if the scale is to be trimmed by sections. The operator will be asked for the number of the section to be trimmed. Enter the number and press ENTER.
4.) **TRIM SCALE** - Select this option if the scale is to be trimmed as a single unit.

To Trim cells/sections/scale:

1.) Place the test weight to be used in the appropriate location on the platform.
   a. To trim a cell, place the test weight over the load cell to be trimmed.
   b. To trim a section, place the test weight in the center of the section to be trimmed.
   c. To trim the scale, place the test weight anywhere on the platform.
2.) Place the cursor beside the appropriate legend in the display and press the ENTER key.
3.) If load cell or section is selected, the legend will "blank". Enter the number of the load cell or section that is going to be trimmed and press the ENTER key. If scale is selected, this step will be skipped.
4.) The cursor will "flash" and a weight will be shown at the top of the display.
5.) Use the UP or DOWN arrows to adjust the weight shown to match the test weight on the scale.
6.) When the appropriate weight is shown, press the ENTER key. The cursor will stop flashing.

Steps for a proper installation of a 2500 to a F.E.M.T.S.

a. Complete the physical installation of all equipment.
b Make sure ALL CELLS are FOUND on the power-up screen.
c. CLEAR MEMORY before setting parameters.

NOTE: Initial Step MUST DO BEFORE PROGRAMMING INSTRUMENT

1. Select Menu
2. Select Service Menu
3. Select Special Functions
4. Select Clear All Memory
5. Press ENTER
6. Program indicator as required

d. Set the OPERATING MODE, DISPLAY CONTRAST, AUDIBLE ALARM, and NUMBER of SCALES.

e. Set all parameters in the CALIBRATION MENU down to CALIBRATION WEIGHT for all scales.

NOTE: DO NOT USE CALIBRATION WEIGHT.

f. Set CELL SENSITIVITY, RESISTANCE (use calibration data sheets packed with each cell) and CALIBRATE (platform[s] unloaded) for each cell in all scales.

g. Go to TRIM, CELL/SECTION/SCALE and select each CELL. TRIM CELL to be certain that all cells start at zero (00) before proceeding.

h. Place a load (2000 lb minimum on a 50k cell) directly over each cell and trim that cell to the test load. Repeat this for ALL CELLS in the system.

i. Go to TRIM, CELL/SECTIONS/SCALE and select each SECTION. TRIM SECTIONS to be certain all sections are starting at zero (00) before proceeding.

j. Place a concentrated load (test cart) directly over each section and trim that section to the test load. Repeat this for ALL SECTIONS in the system.

k. Go to TRIM, CELL/SECTIONS/SCALE and select TRIM SCALE to be certain that the scale is starting at zero (00) before proceeding.

l. Place known test weights (in amount required by Weights & measures to place scale in service) and trim to the exact known weight value.

Note: At this point, the scale is calibrated.

m. Go to SPECIAL FUNCTIONS and select "RESET SECTION PEAKS" and press ENTER to reset.

n. Continue with the installation & setup of any peripheral equipment (printers, remote displays, etc.) and all other functions the customer requires.

o. After the instrument and peripheral setup is correct and complete, print (4) copies of the CALIBRATION REPORT from the SERVICE MENU. One copy for the shop, one for the customer, one inside the instrument and a copy for your records.

Note: If a form printer is NOT available, write down all formats, calibration and parameter information and distribute copies as noted above.

p. Instruct the customer/user on proper operation of his scale. Quote a Service Agreement to keep all equipment in proper operating condition and adjustment.

9. **WRITE PASSWORD**

Select this option to enter or change the password used to enter the SERVICE MENU. The password can be numbers. When a password has been entered and accepted, a "key" will appear beside the SERVICE MENU legend in the OPERATION MENU. This means a password must be entered before the SERVICE MENU can be accessed.

10. **PRINT CALIBRATION REPORT**

When this option is selected, a complete calibration and configuration record is printed if a form printer is part of the system. The records list all of the calibration and configuration parameters that have been programmed into the indicator. It is recommended that a record be printed at the end of the set-up procedure and copies be stored by the customer, technician, service center, and one inside the instrument.

11. **SPECIAL FUNCTIONS**

Select this option to access the Special Functions Menu which contains Span Corners, Hysterisis, Phone Number, Reset Section Peaks, Peak Weights, and Clear All Memory.

a. SERVICE MENU - This option returns the display to the SERVICE MENU.

b. SPAN CORNERS - This option is used when it is appropriate to span the corners of the scale.

Remove all weight from the scale, with the cursor on SPAN CORNERS, press ENTER. Enter the weigh amount being used and press ENTER. Follow the screen instructions. Place the weight shown in the display DIRECTLY over load cell 1. The Cell 1 counts and the total counts should be about the same. If they are not, move the weight so that it is more directly over the cell. When the two numbers are about the same, press the ENTER key. Repeat the process for load cell 2. When ENTER is pressed again, the display will move to cell 3. Repeat the process for all of the load cells.

c. **HYSTERESIS** - This option is used when it is appropriate to implement the HYSTERESIS program.

NOTE: In most applications, this step will not be used. All of the settings should be "0". Contact Technical Support before attempting any hysteresis corrections.

HYSTERESIS

The difference between two indicated or represented values for any given test load, one obtained by increasing the loading from zero to the given test load, the other obtained by decreasing the loading from the maximum rated load to the given test load.

UPPER

The weight value at which the correction factor will be entered into the calculation, when un-loading the scale.

BACKLASH

The weight value equal to the test weight increment plus the impact over-run caused by putting the test weight on the scale.

LOWER
The weight value at which the correction factor is dropped from the calculation when coming down.

HYSTERESIS
The correction value to be added or subtracted from the UPPER weigh value.

+/-
The sign, "+" to add, or "-" to subtract the HYSTERESIS value from the UPPER weight value.

4. **PHONE #** - This should be the telephone number of the local service organization, including area code. This is the telephone number that will be displayed if the indicator detects load cell problems. This number is entered by the technician at the time of installation.

5. **RESET SECTION PEAKS** - Resets the peak weight values to zero. This must be done on first time installation.

6. **PEAK WEIGHTS** - The highest weight that has crossed section 2 of the scale.

7. **CLEAR ALL MEMORY** - This option clears all of the data in the memory. This includes the calibration and configuration data, as well as the product, transaction and other operator entered data. This is to be performed BEFORE initial setup, doing so after setup will erase all entered data.

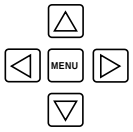
*** USE THE “CLEAR ALL MEMORY” FEATURE WITH EXTREME CAUTION***

SECTION 5:
OPERATOR SECTION

A. Introduction

The 2500 indicator is designed to be used in a wide variety of truck, floor, hopper, and tank scale applications. The load cells are interfaced with the indicator through the sectional controller, 15235 and power supply 15236. The indicator features Intalogix™ technology. The indicator may be interfaced with a variety of printers. An RS-232 interface allows for the transfer of data to the indicator from a computer and vice versa.

B. Front Panel



Arrow Keys - When pressed, these keys move the cursor in the display in the direction indicated.

Menu Key - When pressed, this key changes the display to the Operation Menu. This key can also be used to return the display to the last menu screen that was shown.

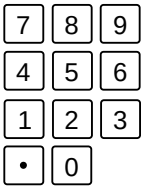
Zero Key - This key sets the weight display to the Center-of-Zero.

O/U
PRINT

Print Key - When pressed, a ticket will be printed. In the Data Terminal mode, an Inbound or Outbound Gross ticket, or a Gross, Tare, Net ticket may be printed. In the Weigh Only mode, a Gross Weight ticket will be printed.

Units Key - Changes the units of weight displayed, depending on the selection made in the Calibration Menu.

Enter Key - Used to enter selections into memory during programming.

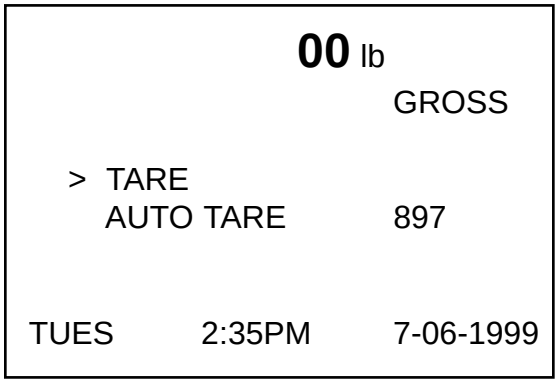


0 through 9 - Keys - Used to enter numeric data, such as tares and IDs.

The scale can be setup to operate in one of two modes: **WEIGHT ONLY**, commonly called GROSS, TARE, NET weighing or IN/OUT weighing. See Section 4, C, under Service Menu for selection information. The operating mode is set in the Service Menu. When the system is powered up, the display for the Operating Mode will be shown.

C. WEIGHT ONLY, Main Menu

When the operating mode is set up for WEIGH ONLY mode, the display will show:



1. **00** lb GROSS
   This display is the weight on the platform and the weigh mode that is active.

2. **Tuesday 2:35PM**
   This is the current day and time with the appropriate AM or PM legend. The time is in the hour, minute format.

3. **7-06-1999**
   This is the current date in a month, day, and year format.

4. **897**
   This number represents the number of transactions that can be stored before the memory buffer begins to over-write itself. The maximum number of stored transactions is 900. If a report is printed and transactions deleted before the 900 number is reached, the count will reset to zero. To prevent over-writing records, print a report summary and delete transaction data before this number reaches zero.

5. **TARE**
   This option is used when a Tare is to be entered through the keyboard or keypad.

6. **AUTO TARE**
   This option is used when the weight displayed is used as a Tare weight.

Use the UP or DOWN arrow keys on the keypad to place the arrow next to the option to be selected. Press the ENTER key on the keypad to select the option. Press the MENU key to display the Operations Menu.

WEIGHT ONLY usage summary:
There are two options available in the WEIGH ONLY MODE, Gross Weighing and Gross-Tare-Net Weighing.

Gross Weighing
1. Press the ZERO key to "zero" the unloaded scale if necessary.
2. Place the object to be weighed on the platform. When the display is stable, press the PRINT key and a Gross Weight Ticket will be printed if optional printer is installed.

Gross-Tare-Net Weighing

1. Press the ZERO key to "zero" the unloaded scale if necessary.
2. Place the empty container on the platform.
3. Choose TARE or AUTO TARE at the menu.
    a. If TARE is selected, enter the known Tare Weight through the keypad.
    b. If AUTO TARE is selected. When the display is stable, press the ENTER key. The displayed weight will be stored as a Tare Weight.
4. Remove the container from the platform and fill it with the product to be weighed.
5. Place the filled container back onto the platform.
6. Press the PRINT key and a Gross-Tare-Net Ticket will be printed if optional printer is installed.

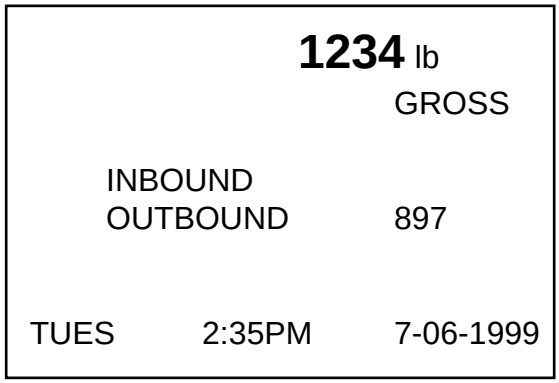
Note: The Gross weight is the Tare weight plus the product weight. The Net weight is the product weight, only. The Tare weight is the value entered in Step 4.

Mode Change

When a TARE or AUTO TARE is entered, the scale automatically switches from the Gross Only Mode to the Gross-Tare-Net Mode. To change the scale from the Gross-Tare-Net Mode back to the Gross Only Mode, enter a "0" Tare by pressing "0" then ENTER.

D. IN / OUT, Main Menu

When the operating mode is set up for IN/OUT mode, the display will show:



1. **12340 lb GROSS**
   This display is the weight on the platform and the weigh mode that is active.

2. **"~"**
   A tilde, "~" to the right of the displayed Gross weight, indicates there is motion on the platform. (Not shown).

3. **INBOUND**
   This option is selected to do INBOUND weighing.

4. **OUTBOUND**
   This option is selected to do OUTBOUND weighing.

5. **897**
   This number represents the number of transactions that can be stored before the memory buffer begins to over-write itself. The maximum number of stored transactions is 900. If a report is printed and transactions deleted before the 900 number is reached, the count will reset to zero. To prevent over-writing records, print a report summary and delete transaction data before this number reaches zero.

6. **SCALE X**
   If more than one scale is selected, this legend will appear to show which scale the displayed values are from. (Not shown)

7. **TUESDAY 2:35PM**
   This is the current day and time with the appropriate AM or PM legend. The time is in the hour, minute format.

8. **7-06-1999**
   This is the current date in a month, day, and year format.

Use the **UP** or **DOWN** arrow keys on the keypad to place the arrow next to the option to be selected. Press the ENTER key on the keypad to select the option. Press the MENU key to display the Operations Menu.

IN/OUT Weighing Mode Summary

IN/OUT weighing consists of weighing a container inbound, either full or empty, then weighing the same container outbound, full or empty, and printing a ticket with the two weights shown. The two weights for the same container, an inbound weighment with a stored tare, or an outbound weighment with a stored tare, is called a complete transaction. An inbound weighment with NO outbound weighment is an incomplete transaction.

1. With the indicator powered up, press the ZERO key.
2. Place the container to be weighed on the platform. This will be the first weighment.
3. Use the UP or DOWN arrow key to place the curser beside "INBOUND" and press the ENTER key.
4. The display will prompt the operator for a "LOOP ID." This is the identification number that will be used to identify the complete transaction. Enter the ID number to be used through the keypad and press the ENTER key. The ID number should be marked on the container so that it can be used again on the outbound weighment. (License number, trailer #, etc.)
5. An INBOUND ticket can be printed. The data for this partial transaction will be stored in the indicator with the "LOOP ID" number as the transaction recall label.
6. Remove the container from the platform. Material can be added or removed from the container.
7. Move the container back onto the platform. Use the UP or DOWN arrows to place the curser beside OUTBOUND and press the ENTER key.

8. The display will prompt the operator for the "LOOP ID" that was entered for this transaction on the inbound weighment. Enter the same ID through the keypad and press the ENTER key.
9. The indicator will retrieve the inbound data from memory and combine it with the new outbound data and a INBOUND/OUTBOUND ticket will be printed. The data will then be stored as a complete transaction.

Options:

1. Weighing, LOOP ID, **With Inbound Ticket**

This is the default setup. No changes have to be made. The defaults are:

a. LOOP ID Only
b. Inbound Ticket Printed
c. Outbound Ticket Printed
d. Transaction Entered Into The Report

2. Weighing, LOOP ID, **No Inbound Ticket**

This sequence sets the program for NO INBOUND TICKET to be printed. This is done by setting all INBOUND data locations to zero.

To do this:

1. Go to Operator Menu
2. Select Configuration Menu
3. Select Communications Port Menu
4. Select COM port, 2 or 3.
5. Select INBOUND FORMAT MENU
6. Set all locations to zero.
7. Press the ENTER key

3. Weighing, LOOP ID, Other ID, **With Inbound Ticket**

This sequence sets the program to accept an ID Number which will be printed on the Inbound and Complete Transaction Tickets.

To set up the ID:

1. Go to Operator Menu
2. Select Configuration Menu
3. Select Prompts Menu
4. Select Product IN
5. Press the ENTER key to toggle between YES and NO.
6. With YES displayed, press the Menu Key

4. Weighing, LOOP ID, Other ID, **No Inbound Ticket**

This sequence sets the program to accept an ID Number which will be printed on the Inbound and Complete Transaction Tickets. To setup the Other ID:

1. Go to Operator Menu
2. Select Configuration Menu
3. Select Prompts Menu
4. Select Product IN
5. Press the ENTER key to toggle between YES and NO.
6. With YES displayed, press the Menu Key

This sequence sets the program for NO INBOUND TICKET to be printed. This is done by setting all INBOUND data locations to zero. To do this:

1. Go to Operator Menu
2. Select Configuration Menu
3. Select Communications Port Menu
4. Select COM port, 2 or 3.
5. Select INBOUND FORMAT MENU
6. Set all locations to zero.

SECTION 6:
DIAGNOSTICS / TROUBLESHOOTING

A. Diagnostics :

The 2500 instrument has diagnostic tools to help troubleshoot a system error.

1. On POWER-UP, check for CELLS FOUND 1,2,3,4,5,6,7,8, etc. Only properly wired and functioning sectional controllers are "found".
2. In SERVICE MENU, go to CELL OUTPUT (COUNTS) and check for proper loading and proper cell outputs.
3. Use the troubleshooting flow chart in Appendix IX.
4. Use power checks in Appendix XI.
5. Use 2500 test box assembly for system troubleshooting, instruction manual 50526.

B. Load Cell Failure:

If the following message appears in the display, check the load cell and associated wiring.
Use the troubleshooting flow chart in Appendix IX.

This message is triggered by one of several conditions. If this is the initial installation, check for incorrect wiring or electronic problems in the sectional controller.

For more information about the LOAD CELL FAILURE(S):

1. Press the MENU key. The display will show the OPERATION MENU.
2. Select the SERVICE MENU from the OPERATION MENU.
3. In the SERVICE MENU, select CELL OUTPUT (COUNTS).
4. The display will show the load cells, the calibration counts and the current counts. Use the readings to verify output(s) and loading. Any load cells that are deemed "bad" will be highlighted.

C. Sectional Controller Failure:

At the time of installation, if the sectional controller is miswired, it will not communicate with the indicator and the cells will be listed as "NONE" in the display. When the ZERO key is pressed, the following message may appear:

LOAD CELL(S) BAD CHECK THAT SCALE IS EMPTY IF SCALE IS EMPTY CALL FOR SERVICE xxx-xxx-xxxx OPERATE THE ZERO KEY TO CONTINUE

This message indicates that something has happened to the scale and the weight being seen by the indicator is outside the allowed zero reference.

SECTION 7:
ACCESSORIES AND PARTS LISTS

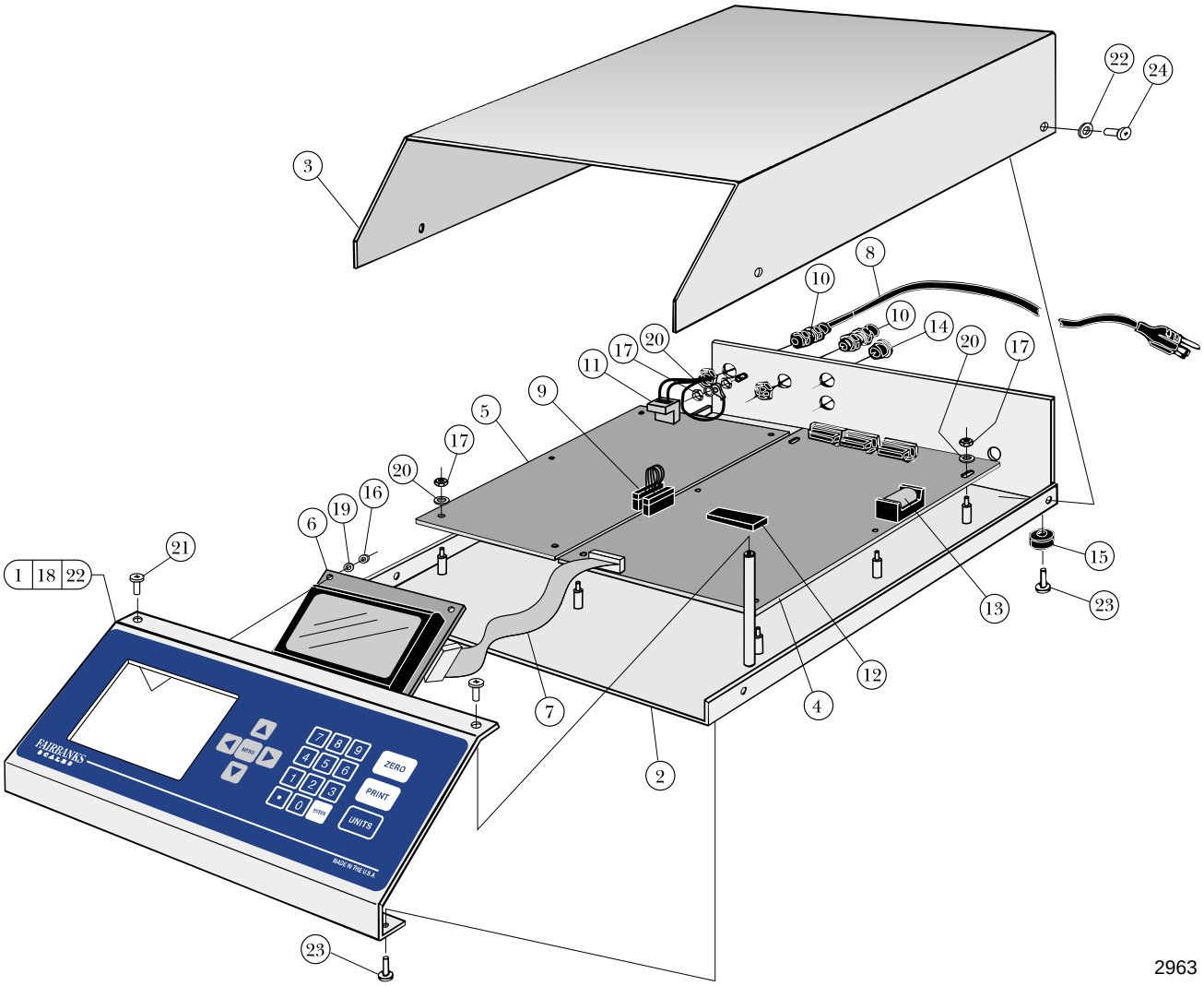
A. Accessories

Accessory Number	Description
15323	Modem Accessory
15642	Keyboard
15341	Expansion Kit
15218	PC Board
15236	Power Supply
15045	PC Board
15235	Sectional Controller
15050	PC Board
15246	Sectional Controller Prom Kit

B. IND-R2500-1 Parts List

Item	Part #	Description
1	15342	Keyboard Assembly
2	15252	Base Assembly
3	15253	Cover
4	15460	PCB Assembly, Mother Board
5	15056	PCB Assembly, Communication
6	15261	Display Assembly
7	15210	Cable Assembly (Display)
8	15259	Power Cord Assembly
9	15260	Cable Assembly
10	17534	Connector, Liquid Tight
11	17503	Block Terminal Plug 3 Pos
12	15263	Prom Kit
13	14695	Battery, Lithium 3.5V
14	12366	Hole Plug
15	12103	Foot
16	10102	Nut, Hex, 4-40
17	10103	Nut, Hex, 6-32
18	10104	Nut, Hex, 8-32
19	10200	Washer, Lock, Ext Tooth No. 4
20	10201	Washer, Lock, Ext Tooth No. 6
21	10306	Screw,Mach,FH Phil 6-32 x .38
22	11126	Washer, Plain No. 8
23	11138	Screw,Mach PH Phil 8-32 x .38
24	13468	Screw, Sealing 8-32 x .50

Parts Diagram



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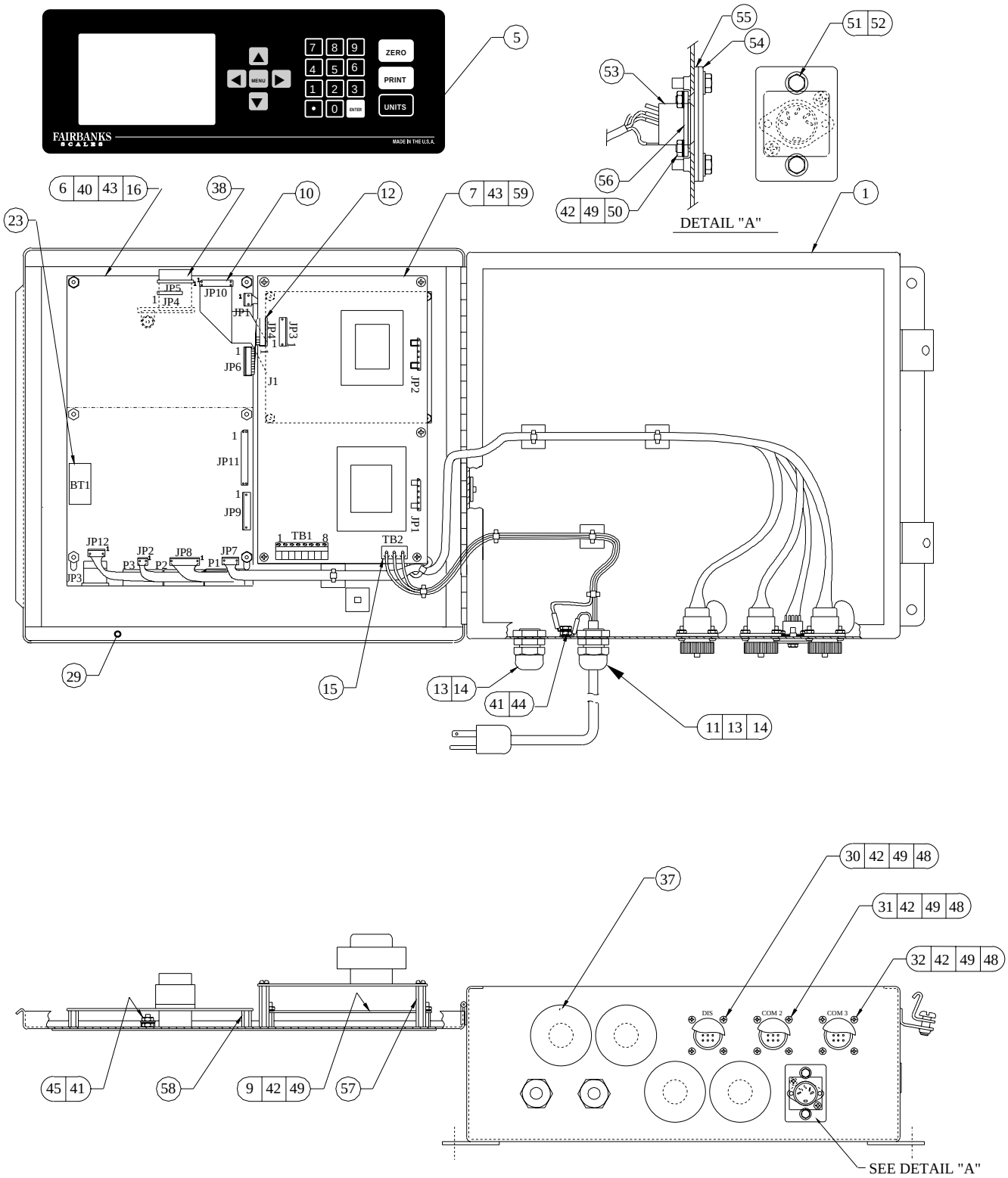
C. IND-HR2500-1 Parts List

Item	Part #	Description
1	15352	Box Assembly
5	15233	Keyboard, Instrument
6	15211	PCB Assembly, Mother Board
7	15056	PCB Assembly, Communication
9	15261	Display Assembly
10	15210	Cable Assembly, Display
11	15435	Power Cord Assembly
12	15260	Cable Assembly
13	12342	Gasket
14	17534	Connector, Liquid Tight
15	17503	Block, Terminal, Plug 3 Pos.
16	15263	Prom Kit
23	14695	Battery, Lithium 3.5V
29	15991	Gasket
30	15432	Cable Assembly, Remote Display 4-20mA Output
31	15437	Cable Assembly, RS232 Output
32	15438	Cable Assembly, RS232 Output
38	17622	Clamp, Cable, Flat
40	11102	Nut, Hex, 6-32
41	11104	Nut, Hex, 8-32
42	11192	Washer, Lock, Ext Tooth No. 4
43	11191	Washer, Lock, Ext Tooth No. 6
44	11188	Washer, Lock, Ext Tooth No. 8
45	11126	Washer, Plain No.8
48	11149	Screw, Mach PH Phil 4-40 x .38
49	11106	Nut, Hex 4-40
50	11219	Screw, Mach PH Phil 4-40 x .25
51	11078	Screw, Cap Hex Hd 8-32 x .50
52	11339	Washer, Plain (Nylon) No. 8
53	15436	Cable Assembly Computer Keyboard
54	16006	Plate
55	16007	Gasket
56	15443	Plate, Connector
57	11995	Spacer, Hex (SST) 6-32 Thds. x 1.25 lg.
58	11998	Spacer, Hex (SST) 6-32 Thds. x .50 lg.
59	11153	Screw, Mach PH Phil 6-32 x .25

Parts Diagram



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D. Parts List, Sectional Controller 15235 And Power Supply 15236

Parts common to both:

Part No.	Description
15647	Cover
15648	Gasket
11075	Screws, Cover, 10-32 x .50
17535	Connectors, Liquid Tight, Large
12342	Connector Plug
14083	Screw, Sealing
11059	Bolt, Mounting, .38-16 x .75
11097	Nuts, Hex .38-16 x .75

Parts unique to each accessory:

Part No.	15235 Sectional Controller
16545	Box Assembly
15050	PCB Assembly
11766	Prom, Programmed
	15236 Power Supply
16546	Box Assembly
15045	PCB Assembly
17545	Connector, Liquid Tight, Small

APPENDIX I: PROGRAMMING REFERENCE CHART

A. OPERATION MENU
- 1. TIME AND DATE
  - a. SET TIME
  - b. SET AM
  - c. SET PM
  - d. TIME FORMAT
  - e. DATE FORMAT
  - f. YEAR FORMAT
- 2. TICKET NUMBER
- 3. KEYBOARD TARE
- 4. AUTOTARE
- 5. MODEM SERVICE
  - 1) OPERATION MENU
  - 2) INITIALIZE MODEM
  - 3) BAUD SELECT
  - 4) TELEPHONE
  - 5) DIAL
  - 6) REDIAL
  - 7) HANGUP
  - 8) COMPORT ENABLED
  - 9) MODEM COMMAND
- 6. CONFIGURATION MENU
- 7. SERVICE MENU

B. CONFIGURATION MENU
- 1. OPERATIONS MENU
- 2. KEYBOARD TARE
- 3. AUTOTARE
- 4. SELECT SCALE
  - a. CONFIGURATION MENU
  - b. INBOUND SCALE
  - c. OUTBOUND SCALE
  - d. SELECT SCALE
- 5. TITLE
  - a. CONFIGURATION MENU
  - b. TITLE LINE 1
  - c. TITLE LINE 2
  - d. TITLE LINE 3
  - e. TITLE LINE 4
  - f. TITLE LINE 5
- 6. FIELD NAME

a. MENU		PROMPT
b. FIELD NAME	1	GTN IN OUT
c. FIELD NAME	2	GTN IN OUT
d. FIELD NAME	3	GTN IN OUT
e. FIELD NAME	4	GTN IN OUT
f. FIELD NAME	5	GTN IN OUT
g. FIELD NAME	6	GTN IN OUT
h. FIELD NAME	7	GTN IN OUT

- 7. PRODUCT ID

8. PRODUCT PROMPT
    a. CONFIGURATION MENU
    b. PROMPT GTN
    c. PROMPT IN
    d. PROMPT OUT
9. REPORTS
    a. CONFIGURATION MENU
    b. REPORT GENERATOR 1
    c. TRANSACTION REPORT 1
    d. REPORT GENERATOR 2
    e. TRANSACTION REPORT 2
    f. DELETE TRANSACTIONS
    g. TARE REPORT
    h. VIEW TARES
    i. DELETE TARES
    j. INCOMPLETE REPORT
    k. VIEW INCOMPLETE
    l. DELETE INCOMPLETES
    m. VIEW PRODUCT
    n. DELETE PRODUCT
10. DISPLAY CONTRAST
11. AUDIBLE ALARM
12. LOAD CELL DIAGNOSTICS
13. 4 TO 20 mA SETUP
    a. CONFIGURATION MENU
    b. MAXIMUM WEIGHT
    c. ADJUST SPAN 20 mA
    d. MINIMUM WEIGHT
    e. ADJUST ZERO 4mA
    f. MODE (GROSS/NET)
14. COMMUNICATION PORTS
    a. COMMUNICATION MENU
    b. COM PORT 2
    c. CTS RTS CONTROL
    d. DEVICES
        1) COMMUNICATIONS MENU
        2) COM PORT
        3) CTS RTS CONTROL
        4) TICKET PRINTER 50-3925
        5) TICKET PRINTER 50-3930
        6) TICKET PRINTER SP2000
        7) TICKET PRINTER PTR 610
        8) TAPE PRINTER 50-3715
        9) FORM PRINTER 50-3921
        10) FORM PRINTER OKI320/520
        11) CUSTOM DRIVER
        12) COMPUTER (PC)
            a) SETUP MENU
            b) CONTINUOUS
            c) DEMAND
            d) AUTO
            e) CHECKSUM

e. DEFAULT FORMAT
f. INBOUND FORMAT
1) COMMUNICATIONS MENU
2) TICKET LOCATION FORMAT
g. OUTBOUND FORMAT
1) COMMUNICATIONS MENU
2) TICKET LOCATION FORMAT
h. GROSS*TARE*NET FORMAT
1) COMMUNICATIONS MENU
2) TICKET LOCATION FORMAT
i. BAUD SELECTION
j. INVERSE PRINT
1) COMMUNICATIONS MENU
2) INVERT IN
3) INVERT OUT
4) INVERT GTN
k. ENLARGED CHARACTERS
1) COMMUNICATIONS MENU
2) LARGE IN
3) LARGE OUT
4) LARGE GTN
l. FORM SIZE
1) COMMUNICATIONS MENU
2) COM 2
3) COM 3
m. REMOTE DISPLAY
1) COMMUNICATIONS MENU
2) LAMPBANK
3) CONTINUOUS GROSS WEIGHT
4) GROSS ON PRINT
5) TIME OUTPUT

C. SERVICE MENU
1. OPERATION MENU
2. OPERATING MODE
a. MENU
b. SCALE WEIGHT ONLY/DATA TERMINAL
c. HARDWARE NO DEVICE
3. UPDATE RATE
4. ZERO MODE
a. MENU
b. 2% OF CAPACITY
c. 100% OF CAPACITY
d. ZERO SWITCH DISABLED
e. PRINT INHIBIT
f. ENABLE WEIGHT
5. TARE MODE
a. MENU
b. ENABLE TARE
c. DISABLE TARE (GROSS ONLY)
d. MANUAL TARE ID
e. AUTO CLEAR
f. EXPIRATION (DAYS)

6. NUMBER SCALES
7. CELL OUTPUT (COUNTS)
8. CALIBRATION
    a. SCALE ID
    b. SCALE UNITS
        1) MENU
        2) LB
        3) LB/KG
        4) LB/TON
        5) LB/TONNE
        6) KG
        7) KG/LB
        8) KG/TON
        9) KG/TONNE
        10) TON
        11) TON/LB
        12) TON/KG
        13) TON/TONNE
        14) TONNE
        15) TONNE/LB
        16) TONNE/KG
        17) TONNE/TON
        18) DUAL UNITS
    c. DIVISION SIZE
        50 20 10
        5 2 1
        0.5 0.2 0.1
        0.05 0.02 0.01
        0.005 0.002 0.001
        DUAL RANGE MENU
    d. MOTION BAND
        1) MENU
        2) 0.5d
        3) 1.0d
        4) 2.0d
        5) 3.0d
    e. AUTO ZERO TRACKING BAND
        1) MENU
        2) 0.6d
        3) 1.0d
        4) 2.0d
        5) 3.0d
    f. FILTER FACTOR
        1) MENU
        2) HEAVY
        3) HEAVY-MEDIUM
        4) MEDIUM
        5) MEDIUM-LIGHT
        6) LIGHT
        7) OFF
    g. FIRST CELL ID

- h. LAST CELL ID
- i. CELL CAPACITY
    - 1) MENU
    - 2) CAPACITY
    - 3) lb
    - 4) ton
    - 5) kg
    - 6) tonne
    - 7) Newtons
- j. SCALE CAPACITY
- k. TEST LOAD
- l. CELL SENSITIVITY
    - 1) CELL
    - 2) SENSITIVITY
    - 3) RESISTANCE
    - 4) CALIBRATE
- m. SPAN
    - 1) CALIBRATION WEIGHT
    - 2) TEST LOAD
- n. TRIM
    - 1) MENU
    - 2) TRIM CELL
    - 3) TRIM SECTION
    - 4) TRIM SCALE

7. WRITE PASSWORD
8. PRINT CALIBRATION REPORT
9. SPECIAL FUNCTIONS
    - a. SERVICE MENU
    - b. SPAN CORNERS
    - c. HYSTERESIS
        - 1) MENU
        - 2) UPPER
        - 3) BACKLASH
        - 4) LOWER
        - 5) HYSTERESIS
        - 6) +/-
    - d. PHONE #
    - e. RESET SECTION PEAK
    - f. PEAK WEIGHTS
    - g. CLEAR ALL MEMORY

APPENDIX II: A TYPICAL PROGRAM PRINT-OUT

CALIBRATION and CONFIGURATION RECORD 8:28AM 4-12-1999

CELL	SPAN ZERO	CELL ZERO	CELL OUTPUT	CELL WEIGHT	SPAN FACTOR	SENSITIVITY mV/VOLT	uV/d
1	8601	8800	89662	25000	0.30875	1.97780	15.0
2	8569	8591	89504	24980	0.30875	2.12110	15.0
3	8575	8376	89486	24980	0.30875	2.01567	15.0
4	8613	8515	89505	24980	0.30875	1.99981	15.0
5	8762	8863	89702	24980	0.30875	2.04450	15.0
6	8751	8953	89695	25000	0.30875	1.91111	15.0
7	8747	8648	89687	24980	0.30875	2.04446	15.0
8	8740	9022	89701	25000	0.30875	2.00000	15.0

SCALE 1

Calibration counter	1
Calibration time	2:11PM
Calibration date	4-11-1999
Configuration counter	4
Configuration time	8:26AM
Configuration date	4-12-1999
Dual range capacity	100000
Scale capacity	200000
Division Size (d)	20
Units	lb/kg
Motion Band	3.0 d
Auto Zero Band	3.0 d
FIRST CELL	1
LAST CELL	8
Cell capacity	2500
Cell resistance Ohms	350

4 to 20 mA Output

High weight	20000	High Count	3626
Low weight	00	Low Count	740

INBOUND TICKET	COM2	COM3
GROSS	0.0, 0.0	0.0, 0.0
TARE	0.0, 0.0	0.0, 0.0
NET	0.0, 0.0	0.0, 0.0
AUXILLARY TARE	0.0, 0.0	0.0, 0.0
AUXILLARY NET	0.0, 0.0	0.0, 0.0
INBOUND WEIGHT	0.2, 0.0	0.0, 0.0

TARE ID	0.1, 0.0	0.0, 0.0
TIME	0.0, 0.8	0.0, 0.0
DATE	0.0, 2.0	0.0, 0.0
TIME IN	0.0, 0.0	0.0, 0.0
TICKET NUMBER	0.0, 0.0	0.0, 0.0
PRODUCT ID	0.0, 0.0	0.0, 0.0
PRODUCT TOTAL	0.0, 0.0	0.0, 0.0
CONVERSION 1	0.0, 0.0	0.0, 0.0
CONV. TOTAL 1	0.0, 0.0	0.0, 0.0
SCALE ID	0.0, 0.0	0.0, 0.0
TITLE LINE 1	0.0, 0.0	0.0, 0.0
TITLE LINE 2	0.0, 0.0	0.0, 0.0
TITLE LINE 3	0.0, 0.0	0.0, 0.0
TITLE LINE 4	0.0, 0.0	0.0, 0.0
TITLE LINE 5	0.0, 0.0	0.0, 0.0
FIELD NAME 1	0.0, 0.0	0.0, 0.0
FIELD NAME 2	0.0, 0.0	0.0, 0.0
FIELD NAME 3	0.0, 0.0	0.0, 0.0
FIELD NAME 4	0.0, 0.0	0.0, 0.0
FIELD NAME 5	0.0, 0.0	0.0, 0.0
FIELD NAME 6	0.0, 0.0	0.0, 0.0
FIELD NAME 7	0.0, 0.0	0.0, 0.0

OUTBOUND TICKET	**COM2**	**COM3**
GROSS	0.4, 0.0	0.0, 0.0
TARE	0.5, 0.0	0.0, 0.0
NET	0.6, 0.0	0.0, 0.0
AUXILLARY TARE	0.0, 0.0	0.0, 0.0
AUXILLARY NET	0.0, 0.0	0.0, 0.0
INBOUND WEIGHT	0.0, 0.0	0.0, 0.0
TARE ID	0.3, 0.0	0.0, 0.0
TIME	0.0, 0.8	0.0, 0.0
DATE	0.0, 2.0	0.0, 0.0
TIME IN	0.1, 0.0	0.0, 0.0
TICKET NUMBER	0.2, 0.0	0.0, 0.0
PRODUCT ID	0.0, 0.0	0.0, 0.0
PRODUCT TOTAL	0.0, 0.0	0.0, 0.0
CONVERSION 1	0.0, 0.0	0.0, 0.0
CONV. TOTAL 1	0.0, 0.0	0.0, 0.0
SCALE ID	0.0, 0.0	0.0, 0.0
TITLE LINE 1	0.0, 0.0	0.0, 0.0
TITLE LINE 2	0.0, 0.0	0.0, 0.0
TITLE LINE 3	0.0, 0.0	0.0, 0.0
TITLE LINE 4	0.0, 0.0	0.0, 0.0
TITLE LINE 5	0.0, 0.0	0.0, 0.0
FIELD NAME 1	0.0, 0.0	0.0, 0.0
FIELD NAME 2	0.0, 0.0	0.0, 0.0
FIELD NAME 3	0.0, 0.0	0.0, 0.0
FIELD NAME 4	0.0, 0.0	0.0, 0.0
FIELD NAME 5	0.0, 0.0	0.0, 0.0
FIELD NAME 6	0.0, 0.0	0.0, 0.0
FIELD NAME 7	0.0, 0.0	0.0, 0.0

GROSS*TARE*NET	COM2	COM3
GROSS	0.2, 0.0	0.0, 0.0
TARE	0.3, 0.0	0.0, 0.0
NET	0.4, 0.0	0.0, 0.0
AUXILLARY TARE	0.0, 0.0	0.0, 0.0
AUXILLARY NET	0.0, 0.0	0.0, 0.0
TIME	0.0, 0.1	0.0, 0.0
DATE	0.0, 2.0	0.0, 0.0
TICKET NUMBER	0.1, 0.0	0.0, 0.0
PRODUCT ID	0.0, 0.0	0.0, 0.0
PRODUCT TOTAL	0.0, 0.0	0.0, 0.0
CONVERSION 1	0.0, 0.0	0.0, 0.0
CONV. TOTAL 1	0.0, 0.0	0.0, 0.0
SCALE ID	0.0, 0.0	0.0, 0.0
TITLE LINE 1	0.0, 0.0	0.0, 0.0
TITLE LINE 2	0.0, 0.0	0.0, 0.0
TITLE LINE 3	0.0, 0.0	0.0, 0.0
TITLE LINE 4	0.0, 0.0	0.0, 0.0
TITLE LINE 5	0.0, 0.0	0.0, 0.0
FIELD NAME 1	0.0, 0.0	0.0, 0.0
FIELD NAME 2	0.0, 0.0	0.0, 0.0
FIELD NAME 3	0.0, 0.0	0.0, 0.0
FIELD NAME 4	0.0, 0.0	0.0, 0.0
FIELD NAME 5	0.0, 0.0	0.0, 0.0
FIELD NAME 6	0.0, 0.0	0.0, 0.0
FIELD NAME 7	0.0, 0.0	0.0, 0.0

APPENDIX III: INTERFACE TO PRINTERS & REMOTE DISPLAYS

A. Interface Section: Printers

Printers: 50-3921, 50-3925, 50-3715 & 50-3930/3960, 50-3950, PTR-610

1. 50-3921 - Okidata Printer Turbo 184:

The following provides the switch settings for the Okidata Printer Turbo 184 when interfaced to the IND-R2500. Use the printer handbook in conjunction with this table to locate the switches. To interface this printer use Accessory 14807 cable.

Function **Switch Block On Controller PCB/Switch No.:**

	1	2	3	4	5	6	7	8
ASCII/Slashed 0	OFF	OFF	OFF					
Form Length: 11"				OFF	ON			
Auto Line Feed/OFF						OFF		
8 Data Bits							ON	
Front Panel Enabled								OFF

Super speed serial board switches:

Function **Switch Block #1 Switch No.:**

	1	2	3	4	5	6	7	8
Odd Parity	ON							
No Parity		ON						
8 Data Bits			ON					
X-ON/OFF Protocol				OFF				
Test Select: Circuit					ON			
Mode Select: Print						ON		
Busy Line Select: "DTR"							ON	ON

Function **Switch Block #2 Switch No.:**

	1	2	3	4	5	6	7	8
9600 Baud	OFF	ON	ON					
DSR: Inactive				OFF				
Buffer: 256 Byte					OFF			
Busy Timing: 200MS						ON		
DTR: Space							ON	
After Power ON								OFF
Not Used								

2. 50-3925 - Document Printer

The following provides the switch settings for the 3925 ticket printer. Use the printer manual in conjunction with this table.

Cable for: Desktop Model: 13464
NEMA 4X Model: 16084

Function	**Switch Block Located On Bottom of Printer Switch No.:**								
	1	2	3	4	5	6	7	8	9
2400 BPS	OFF	ON	ON						
4 Lines Per Inch				ON					
Line Space Setting					ON				
Print Line and Line Feed						OFF			
Normal Print Mode							ON		
Polarity of Busy (Low)								OFF	
Top of Form Busy									ON

These settings reflect printer setup if the default mode is selected in the instrument.

3. 50-3715 - Tape Printer

Cable for: Desktop Model: 14809
NEMA 4X Model: 12654

DS1	**DS2**
6 ON	2,6, 7 ON

* Use the 50-3710 driver for devices which do not state a 50-3715 driver

4. 50-3930/3960 Ticket Printer

Cable for: Desktop Model: 14807
NEMA 4X Model: 16157

1, 2, 3, 6, 8 ON

5. Fargo SP2000 Ticket Printer

Cable for: Desktop Model: 14807
NEMA 4X Model: 16157

The following switch settings are recommended to interface the SP2000 to the 2500-F1 indicator. OFF means the feature is disabled and ON means the feature is enabled. It is recommended that the switch settings not be changed.

	Switch	Position	Feature
SW1	1-1:	OFF	Upside Down Print and Feed
	1-2:	OFF	International Time and Date
	1-3:	OFF	Paper Sensor (as required)
	1-4:	OFF	Wide Print
	1-5:	OFF	n/a
	1-6:	OFF	n/a
	1-7:	OFF	n/a
	1-8:	OFF	n/a
SW2	2-1:	OFF	9600 Baud
	2-2:	OFF	4800 Baud
	2-3:	ON	2400 Baud
	2-4:	OFF	1200 Baud
	2-5:	OFF	300 Baud
SW3	3-1:	ON	Standard Input Mode Self test turn
	3-2:	OFF	Standard Input Mode 1 & 2 ON
	3-3:	OFF	Eat (LF) after (CR)
	3-4:	OFF	Echo Printed Data
	3-5:	ON	Double Strike (as required)
	3-6:	OFF	Always OFF
	3-7:	OFF	Always OFF
	3-8:	OFF	Always OFF

6. Ticket Printer PTR 50-3950

Cable for: Desktop Model: 13464
NEMA 4X Model: 16084

Switch Settings:

SW1	**SW2**
01100011	10011010

2400 Baud, No Parity, 8 Bit, Busy=0

7. Ticket Printer PTR 610

Cable for: Desktop Model: 13464
NEMA 4X Model: 16084

Switch Settings:

SW1
12345678
01010100

1200 Baud, Odd Parity, 7 Bit, Busy=0

8. Ticket Printer 590

Cable for: Desktop Model: 14807
NEMA 4X Model: 16157

Switch Settings:

SW1	**SW2**
00100010	00000000

9600 Baud, No Parity, 8 Bit, Busy=0

9. Ticket Printer 295

Cable for: Desktop Model: 14807
NEMA 4X Model: 16157

Switch Settings:

SW1
1010000000

9600 Baud, No Parity, 8 Bit, Busy=0

B. Interface Section: Remote Displays

NOTE: When connecting a remote display to a IND-R2500, use DIS.

1. Fairbanks Model 1405 Remote Display

Cable for: Desktop Model: 13486
NEMA 4X Model: 15585
Order Accessory Cable 17216 (by the foot).

Wire the cable as follows:

P3 on the Mother Board

IND-R2500, DB9 Connector	1405 Terminal	IND-HR2500
Pin 1 (-)	1 (-)	2 (-)
Pin 9 (+)	2 (+)	1 (+)

At the remote display terminal connect black to terminal 2 and connect red to terminal 1. Depending on the weight display required refer to manual SJ4116 to set S1 switches.

2. Fairbanks Model 1415 Remote Display

Wire the cable as follows:

P3 on the Mother Board,

IND-R2500, DB9 Connector	1415 Terminal	IND-HR2500
Pin 1 (+)	2 (-)	2 (-)
Pin 9 (-)	3 (+)	1 (+)

3. Fairbanks RMT-1401, 1404, 1406, 1401A, 1404A,1406A

Wire the cable as follows:

P3 on the Mother Board,

IND-R2500, DB9 Connector	Display Terminal	IND-HR2500
9 (+)	+15VDC (Pin 1)	1 (+)
1 (-)	(C Loop) Pin 5	2 (-)
	(C Loop) Pin 6 ┐	
	(GND) Pin 2 ──┘	

APPENDIX IV: COMPORTS PIN OUT

(Desktop Model)

DIS	COM 2	COM 3
Pin 1 - TX (-20mA)	Pin 1 - CD (INPUT)	Pin 1 - NC
Pin 2 - NC	Pin 2 - RX (INPUT)	Pin 2 - RX (INPUT)
Pin 3 - NC	Pin 3 - TX (OUTPUT)	Pin 3 - TX (OUTPUT)
Pin 4 - NC	Pin 4 - DTR (OUTPUT)	Pin 4 - NC
Pin 5 - GND	Pin 5 - GND	Pin 5 -GND
Pin 6 - NC	Pin 6 - DSR (INPUT)	Pin 6 - NC
Pin 7 - NC	Pin 7 - RTS (OUTPUT)	Pin 7 - RTS (OUTPUT)
Pin 8 - NC	Pin 8 - CTS (INPUT)	Pin 8 - CTS (INPUT)
Pin 9 - TX (+20mA)	Pin 9 - RI (INPUT)	Pin 9 - NC

(NEMA 4X Model)

DIS	COM 2	COM 3
Pin 1 - TX (+)	Pin 1 - CD	Pin 1 - NC
Pin 2 - TX (-)	Pin 2 - DSR	Pin 2 - NC
Pin 3 - GND(chassis)	Pin 3 - DTR	Pin 3 - GND(chassis)
Pin 4 - NC	Pin 4 - TX	Pin 4 - TX
Pin 5 - NC	Pin 5 - RX	Pin 5 - RX
Pin 6 - NC	Pin 6 - RTS	Pin 6 - RTS
Pin 7 - NC	Pin 7 - CTS	Pin 7 - CTS
Pin 8 - NC	Pin 8 - GND	Pin 8 - GND
Pin 9 - NC	Pin 9 - RI	Pin 9 - NC

APPENDIX V: WIRING DIAGRAM FOR SERIAL OUTPUT

Printer Cable Pin Out

COM 2 or 3	3710/3715	3925/3950/PTR 610	3921/3930/3960/SP2000
Pin 2 - RX	- - -	- - -	Pin 2
Pin 3 - TX	Pin 3	Pin 3	Pin 3
Pin 5 - Ground	Pin 7	Pin 7	Pin 7
Pin 8 - CTS	Pin 20	Pin 4	- - -

3550/3710/3715 Cable for	3925/3950/PTR 610 Cable for	590/295/3921/3930/3960/SP2000 Cable for
NEMA 4X model: 12654	NEMA 4X model: 16084	NEMA 4X model: 16157
Desktop model: 14809	Desktop model: 13464	Desktop model: 14807

2500-F1 or -F2 to Computer

IND-HR2500-1 RS232 (9 Pin AMP)	Computer Pin Sub-D(25 Pin)
Pin 3 Frame Ground	Ground
Pin 4 Tx	Pin 3 Rx
Pin 5 Rx	Pin 2 Tx
Pin 6 RTS	Pin 5 CTS
Pin 7 CTS	Pin 4 RTS
Pin 8 Signal Ground	Pin 7 Signal Ground

APPENDIX VI: Computer Output, COM 2 or Computer Output, COM 3

SETUP MENU

This selection will return to the DEVICES MENU.

CONTINUOUS

Selects Continuous Computer Output Mode.

DEMAND

The Demand output is an output that is transmitted when the instrument receives a CR [Carriage Return character (0DH)] from a computer.

AUTO

Selects Auto Computer Output Mode. The Auto output is an output that is transmitted when an Inbound, Outbound, or GTN ticket is printed.

CHECKSUM

This selection is a toggle ON / OFF. It controls whether a checksum character is sent at the end of the computer output.
The second line of the menu shows the current Output mode that is selected - CONTINUOUS, DEMAND OR AUTO.

A. Continuous Output Mode

The Continuous Computer Output is an uninitiated, unrequested output that gets transmitted at a fixed time interval.

Character String	Description
STX	Start of Text character:(02 Hex)
A	Status Word A
B	Status Word B
C	Status Word C
xxxxxx	Displayed Weight : x = Weight (6 characters if the graduation size does not have a decimal point.) (5 characters if the graduation size does have a decimal point. The decimal point is not sent as part of the character string.
xxxxxx	Tare Value : x = Tare (6 characters if the graduation size does not have a decimal point.) (5 characters if the graduation size does have a decimal point. The decimal point is not sent as part of the character string.
CR	Carriage Return Character:(0D hex)
CS	CheckSum Character:If enabled, this character consists of the last eight bits of the binary sum of all characters transmitted up to this checksum character.

Status Word A

Decimal Point or Zero Location

Bit #	x00	x0	x	x.x	x.xx	x.xxx	x.xxxx	x.xxxxx
0	0	1	0	1	0	1	0	1
1	0	0	1	1	0	0	1	1
2	0	0	0	0	1	1	1	1

Increment Size

Bit #	Count by 1	Count by 2	Count by 5
3	1	0	1
4	0	1	1
5		Always Logic 1	
6		Always Logic 0	
7		Parity Bit	

Status Word B

Bit #	Description	
0	Gross = 0	Net = 1
1	Positive = 0	Negative = 1
2	In Range = 0	Overcapacity = 1
3	No Motion = 0	Motion = 1
4	lb = 0	kg = 1
5	Always Logic 1	
6	Normal = 0	Power Up = 1
7	Parity Bit	

Status Word C

Bit #	Description	
0	Always Logic 0	
1	Always Logic 0	
2	Always Logic 0	
3	Normal = 0	Print Switch Pushed = 1
4	Always Logic 0	
5	Always Logic 1	
6	Normal = 0	Keyboard Tare = 1
7	Parity Bit	

B. Demand Output

When a CR (Carriage Return character (0D Hex) is received on either Com 2 or Com 3 of the instrument, it will output information based on the FROM TOP and FROM RIGHT coordinates in the GROSS*TARE*NET ticket formats menu selections. All character strings that have a non-zero value in either of the coordinates will be transmitted. The order that the character strings appear in the data transmission follows the numbering sequence of the FROM TOP and FROM RIGHT coordinates. An example follows this output description.

Character String	**Description**	**Menu Prompt**
xxxxxxx_yy_GR CR LF (x = Weight, y = Units:fixed length,10 characters) (_GR = Legend:fixed length, 3 characters) or	:Gross Weight(with legend)	:GROSS
xxxxxxx_yy CR LF (x = Weight, y = Units:fixed length, 10 characters)	:Gross Weight (no legend)	:GROSS
xxxxxxx_yy_TA CR LF (x = Weight, y = Units:fixed length, 10 characters) (The space between Weight and Units will be a * if keyboard Tare) (_TA = Legend:fixed length, 3 characters) or	:Tare Weight (with legend)	:TARE
xxxxxxx_yy CR LF (x = Weight, y = Units:fixed length, 10 characters) (The space between Weight and Units will be a * if keyboard Tare)	:Tare Weight (no legend)	:TARE
xxxxxxx_yy_NT CR LF (x = Weight, y = Units:fixed length, 10 characters) (_NT = Legend:fixed length, 3 characters) or	:Net Weight (with legend)	:NET
xxxxxxx_yy CR LF (x = Weight, y = Units:fixed length, 10 characters)	: Net Weight (no legend)	:NET
xx:xxyy CR LF (x = Time, y = am pm:fixed length, 7 characters)	:Time	:TIME
xx-xx-xx CR LF (x = Date:fixed length, 8 characters)	:Date	:DATE
TICKET_NUMBER_xxxxxxxx CR LF (TICKET_NUMBER_ = Legend:fixed length, 14 characters) (x = Ticket Number Value:variable length, 8 characters max)	:Ticket Number	:CON#
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx CR LF	:Title Line 1	:TITLE1
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx CR LF	:Title Line 2	:TITLE2
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx CR LF	:Title Line 3	:TITLE3
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx CR LF	:Title Line 4	:TITLE4
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx CR LF (x = Title Line Text:variable length, 30 characters max)	:Title Line 5	:TITLE5
xxxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 1	:fNAME1
xxxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 2	:fNAME2
xxxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 3	:fNAME3
xxxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 4	:fNAME4
xxxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 5	:fNAME5
xxxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 6	:fNAME6
xxxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 7	:fNAME7

Character String	Description	Menu Prompt
(x = Field Name Title:variable length, 15 characters max) (_ = Space Character) (y = Field Name Entry:variable length, 15 characters max)		
SCALE_ID_xx CR LF (SCALE_ID_ = Legend:fixed length, 9 characters) (x = Scale Identifier:fixed length, 2 characters)	:Scale ID	:SC ID

EOT End of Transmission Character:(04 hex)

CS CheckSum Character:If enabled, this character consists of the last eight bits of the binary sum of all characters transmitted up to this checksum character.

C. Auto Output

When a Gross Tare Net print is made, or an Inbound weighment is completed, or an Outbound weighment is completed, the instrument will output information based on the “FROM TOP and FROM RIGHT coordinates in the GROSS*TARE*NET, INBOUND, and OUTBOUND ticket formats respectively. All character strings that have a non-zero value in either of the coordinates will be transmitted. The order that the character strings appear in the data transmission follows the numbering sequence of the FROM TOP and FROM RIGHT coordinates. An example follows this output description. The details and options on the Gross Tare Net print are the same as the Demand Output Format. See Demand Output for details.

INBOUND and OUTBOUND Formats

Character String	Description	Menu Prompt
xxxxxxx_yy_GR CR LF (x = Weight, y = Units:fixed length, 10 characters) (_GR = Legend:fixed length, 3 characters)	:Gross Weight (with legend)	:GROSS
or		
xxxxxxx_yy CR LF (x = Weight, y = Units:fixed length, 10 characters)	:Gross Weight (no legend)	:GROSS
xxxxxxx_yy_TA CR LF (x = Weight, y = Units:fixed length, 10 characters) (_TA = Legend:fixed length, 3 characters)	:Tare Weight (with legend)	:TARE
or		
xxxxxxx_yy CR LF (x = Weight, y = Units:fixed length, 10 characters)	:Tare Weight (no legend)	:TARE
xxxxxxx_yy_NT CR LF (x = Weight, y = Units:fixed length, 10 characters) (_NT = Legend:fixed length, 3 characters)	:Net Weight (with legend)	:NET
or		
xxxxxxx_yy CR LF (x = Weight, y = Units:fixed length, 10 characters)	:Net Weight (no legend)	:NET
INBOUND_xxxxxxx_yy CR LF (INBOUND_ = Legend:fixed length, 8 characters) (x = Weight, y = Units:fixed length, 10 characters)	:Inbound Weight (with legend)	:WT. IN
or		
xxxxxxx_yy CR LF (x = Weight, y = Units:fixed length, 10 characters)	:Inbound Weight (no legend)	:WT. IN

Character String	Description	Menu Prompt
LOOP_ID_xxxxxxxxxxxxxxx CR LF (LOOP_ID_ = Legend:fixed length, 9 characters) (x = Tare ID Value:variable length, 15 characters max)	:Loop ID	:LOOP ID
xx:xxyy CR LF (x = Time, y = am pm:fixed length, 7 characters)	:Time	:TIME
xx-xx-xx CR LF (x = Date:fixed length, 8 characters)	:Date	:DATE
TIME_IN_xx:xxyy CR LF (TIME_IN_ = Legend:fixed length, 8 characters) (x = Time, y = am pm:fixed length, 7 characters)	:Inbound Time	:TM IN
TICKET_NUMBER_xxxxxxxx CR LF (TICKET_NUMBER_ = Legend:fixed length, 14 characters) (x = Ticket Number Value:variable length, 8 characters max)	:Ticket Number	:CON#
xxxxxxxxxxxxxxx__yyyyyyyyyyyyyyy CR LF (x = Header Title:variable length, 15 characters max) (__ = 2 Space Characters) (y = Header Value:variable length, 15 characters max)	:Header Title and Value HEADER	
xxxxxxxxxxxxxxx_TOTAL_yyyyyyy_zz CR LF (x = Header Title:variable length, 15 characters max) (_TOTAL_ = Legend:fixed length, 7 characters) (y = Total Weight, z = Units:fixed length, 10 characters)	:Header Total	:TOTAL
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx CR LF	:Title Line 1	:TITLE1
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx CR LF	:Title Line 2	:TITLE2
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx CR LF	:Title Line 3	:TITLE3
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx CR LF	:Title Line 4	:TITLE4
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx CR LF (x = Title Line Text:variable length, 30 characters max)	:Title Line 5	:TITLE5
xxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 1	:fNAME1
xxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 2	:fNAME2
xxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 3	:fNAME3
xxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 4	:fNAME4
xxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 5	:fNAME5
xxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF	:Field Name 6	:fNAME6
xxxxxxxxxxxxxxx_yyyyyyyyyyyyyyy CR LF (x = Field Name Title:variable length, 15 characters max) (_ = Space Character) (y = Field Name Entry:variable length, 15 characters max)	:Field Name 7	:fNAME7
SCALE_ID_xx CR LF SCALE_ID_ = Legend:fixed length, 9 characters) (x = Scale Identifier:fixed length, 2 characters)	:Scale ID	:SC ID

EOT End of Transmission Character:(04 hex)

CS CheckSum Character:If enabled,, this character consists of the last eight bits of the binary sum of all characters transmitted up to this checksum character.

Each of the above character strings can be disabled from transmission. To disable a character string (or strings), place 0.0 in both the FROM TOP and FROM RIGHT coordinates in the INBOUND and / or OUTBOUND ticket formats menu selections.

If a character string is disabled, nothing is transmitted. To enable a character string, make either of the FROM TOP or FROM RIGHT coordinates any value other than 0.0 The values entered in the coordinates determine the order that the character strings are transmitted. See the following example.

Example of FROM TOP and FROM RIGHT coordinates for OUTBOUND ticket format:

GROSS	0.1, 0.0, LEGEND = YES
TARE	0.2, 0.0, LEGEND = YES
NET	0.3, 0.0, LEGEND = YES
WT. IN	0.8, 0.0
LOOP ID	0.7, 0.0
TIME	0.6, 0.0
DATE	0.5, 0.0
TM IN	0.9, 0.0
CON#	0.4, 0.0
HEADER	1.0, 0.0
TOTAL	0.0, 0.0
TITLE1	0.8, 0.0
TITLE2	0.0, 0.0
TITLE3	0.0, 0.0
TITLE4	0.0, 0.0
TITLE5	0.0, 0.0
fNAME1	0.0, 0.0
fNAME2	0.0, 0.0
fNAME3	0.0, 0.0
fNAME4	0.0, 0.0
fNAME5	0.0, 0.0
fNAME6	0.0, 0.0
fNAME7	0.0, 0.0
SC ID	0.0, 0.0

Example Output based on the above coordinates:

__63520_lb_GR CR LF	(GROSS)
__20440_lb_TA CR LF	(TARE)
__43080_lb_NT CR LF	(NET)
TICKET_NUMBER_2067 CR LF	(CON#)
11/08/94 CR LF	(DATE)
10:17am CR LF	(TIME)
LOOP_ID_36042 CR LF	(LOOP ID)
INBOUND__20440_lb CR LF	(WT. IN)
_9:46am CR LF	(TM IN)
PRODUCT__SAND	(HEADER)
EOT	
CS	

INBOUND

The following is an updated list of fields available for output in the Inbound ticket format.

Menu Prompt	Description
GROSS	Gross Wt
TARE	Tare Wt
NET	Net Wt
WT. IN	Inbound Wt
LOOP ID	Tare ID
TIME	Time
DATE	Date
TM IN	Time In
CON#	Ticket Nbr
HEADER	Header
TOTAL	Total for Header
TITLE1	Title Line 1
TITLE2	Title Line 2
TITLE3	Title Line 3
TITLE4	Title Line 4
TITLE5	Title Line 5
fNAME1	Field Name 1
fNAME2	Field Name 2
fNAME3	Field Name 3
fNAME4	Field Name 4
fNAME5	Field Name 5
fNAME6	Field Name 6
fNAME7	Field Name 7
SC ID	Scale ID

Use the Up and Down arrow keys to move around and the display will adjust automatically.

OUTBOUND

The following is an updated list of fields available for output in the Outbound ticket format.

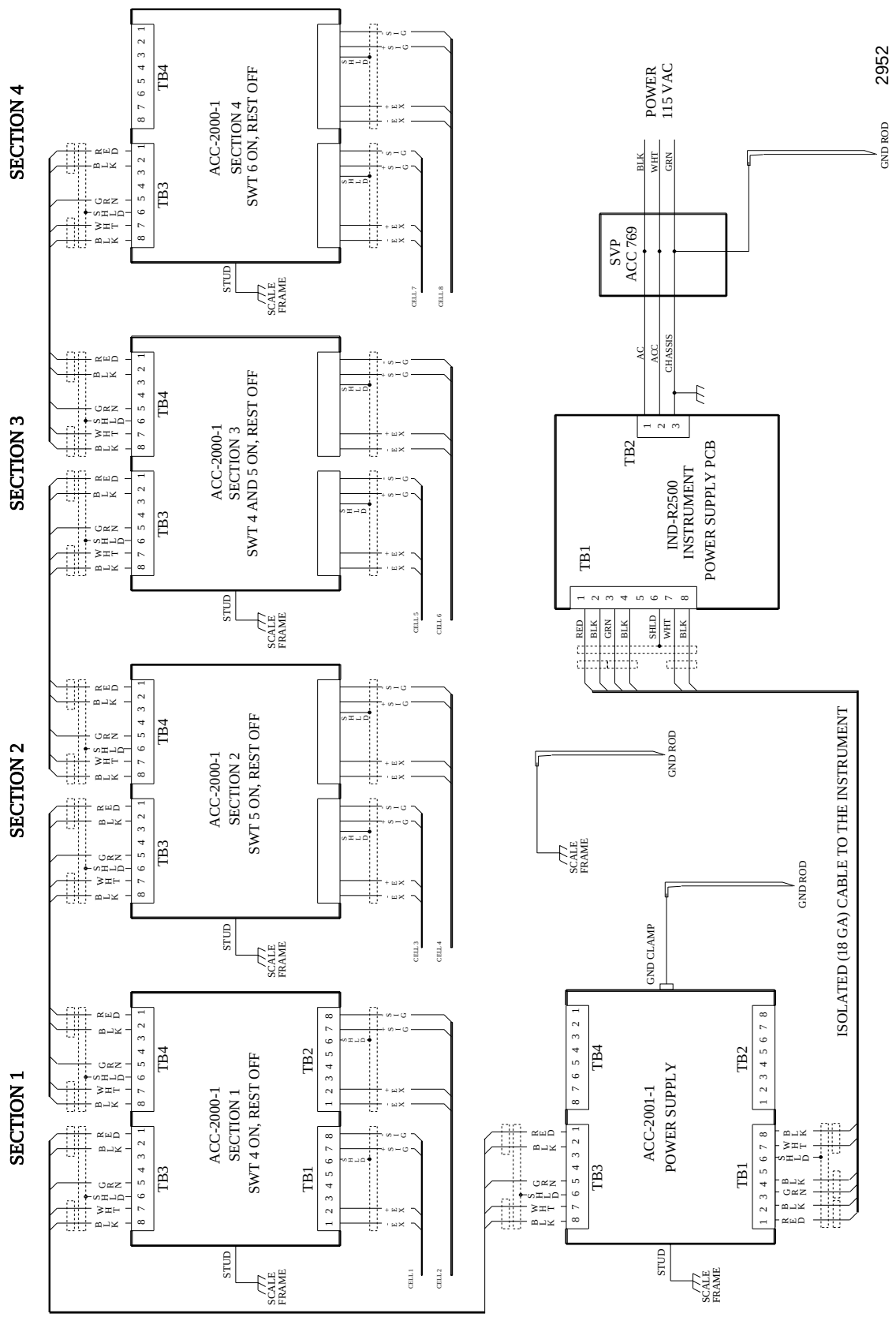
Menu Prompt	**Description**
GROSS	Gross Wt
TARE	Tare Wt
NET	Net Wt
WT. IN	Inbound Wt
LOOP ID	Tare ID
TIME	Time
DATE	Date
TM IN	Time In
CON#	Ticket Nbr
HEADER	Header
TOTAL	Total for Header
TITLE1	Title Line 1
TITLE2	Title Line 2
TITLE3	Title Line 3
TITLE4	Title Line 4
TITLE5	Title Line 5
fNAME1	Field Name 1
fNAME2	Field Name 2
fNAME3	Field Name 3
fNAME4	Field Name 4
fNAME5	Field Name 5
fNAME6	Field Name 6
fNAME7	Field Name 7
SC ID	Scale ID

GROSS*TARE*NET

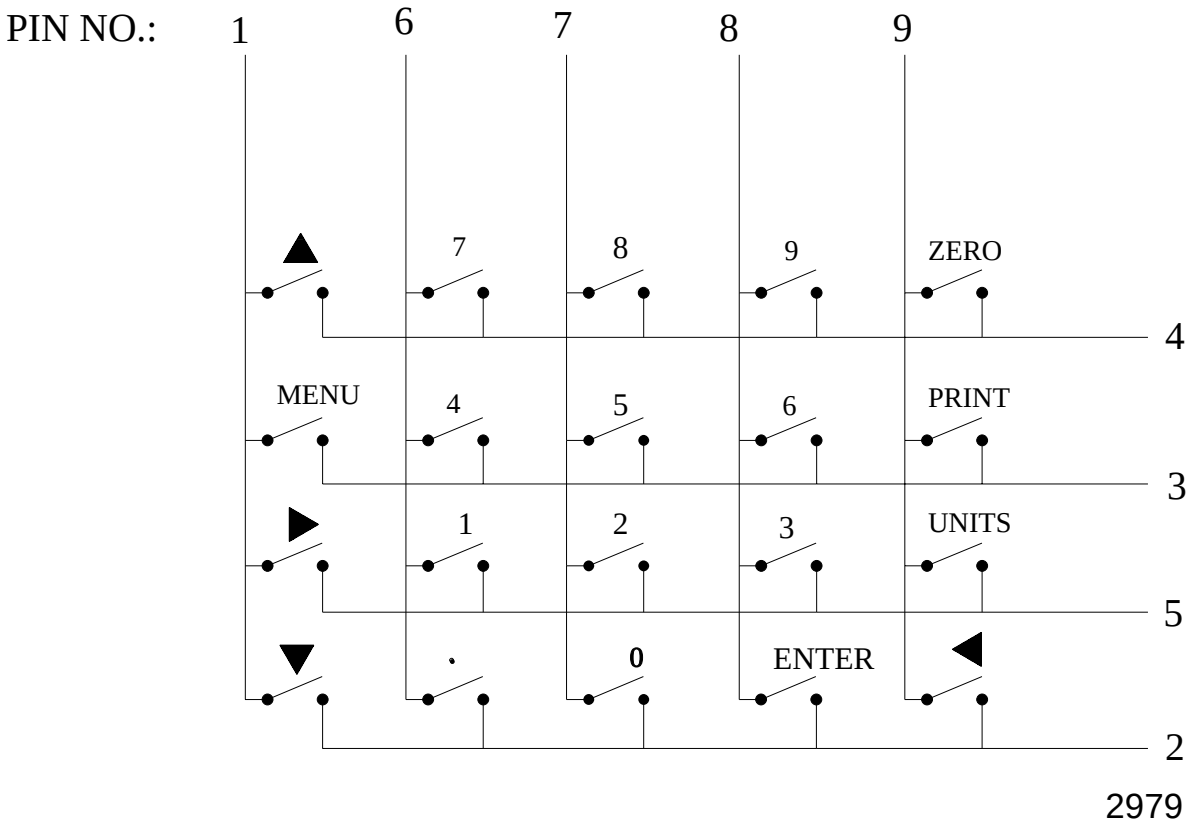
The following is an updated list of fields available available for output in the Gross Tare Net ticket format.

Menu Prompt	Description
GROSS	Gross Wt
TARE	Tare Wt
NET	Net Wt
TIME	Time
DATE	Date
CON#	Ticket Nbr
TITLE1	Title Line 1
TITLE2	Title Line 2
TITLE3	Title Line 3
TITLE4	Title Line 4
TITLE5	Title Line 5
fNAME1	Field Name 1
fNAME2	Field Name 2
fNAME3	Field Name 3
fNAME4	Field Name 4
fNAME5	Field Name 5
fNAME6	Field Name 6
fNAME7	Field Name 7
SC ID	Scale ID

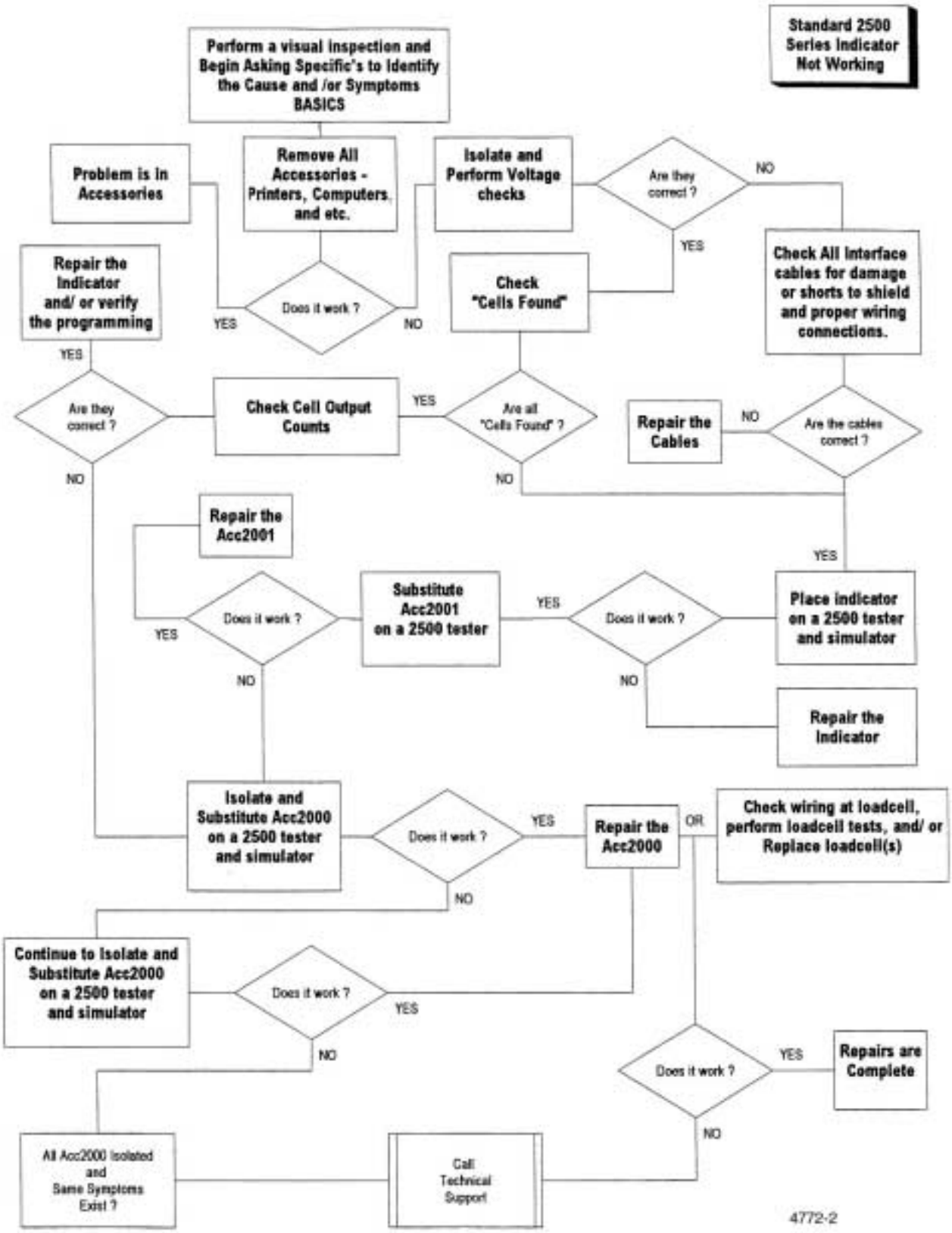
APPENDIX VII: WIRING DIAGRAM



Appendix VIII: Keypad Schematic

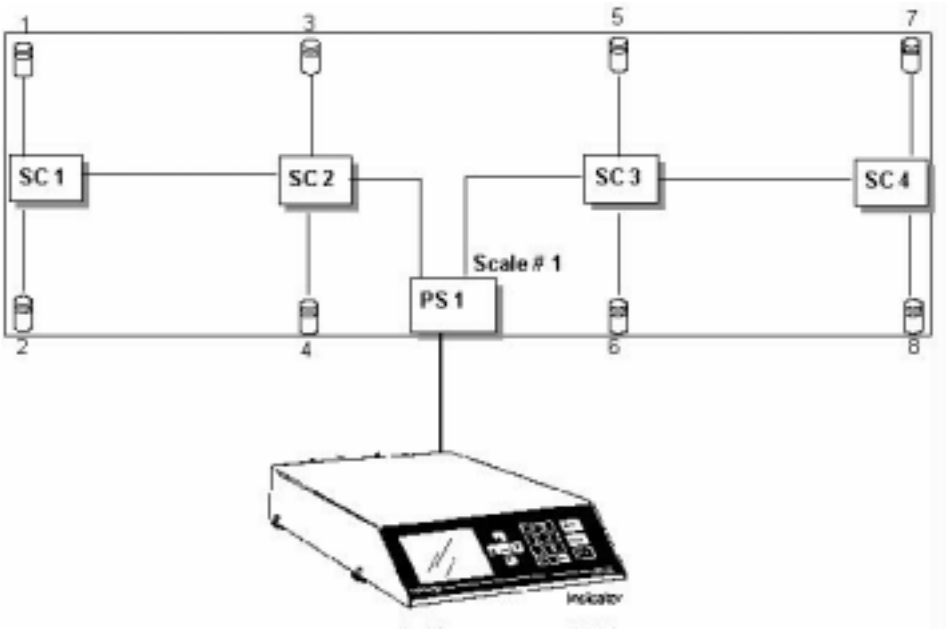


Appendix IX: Flow Chart

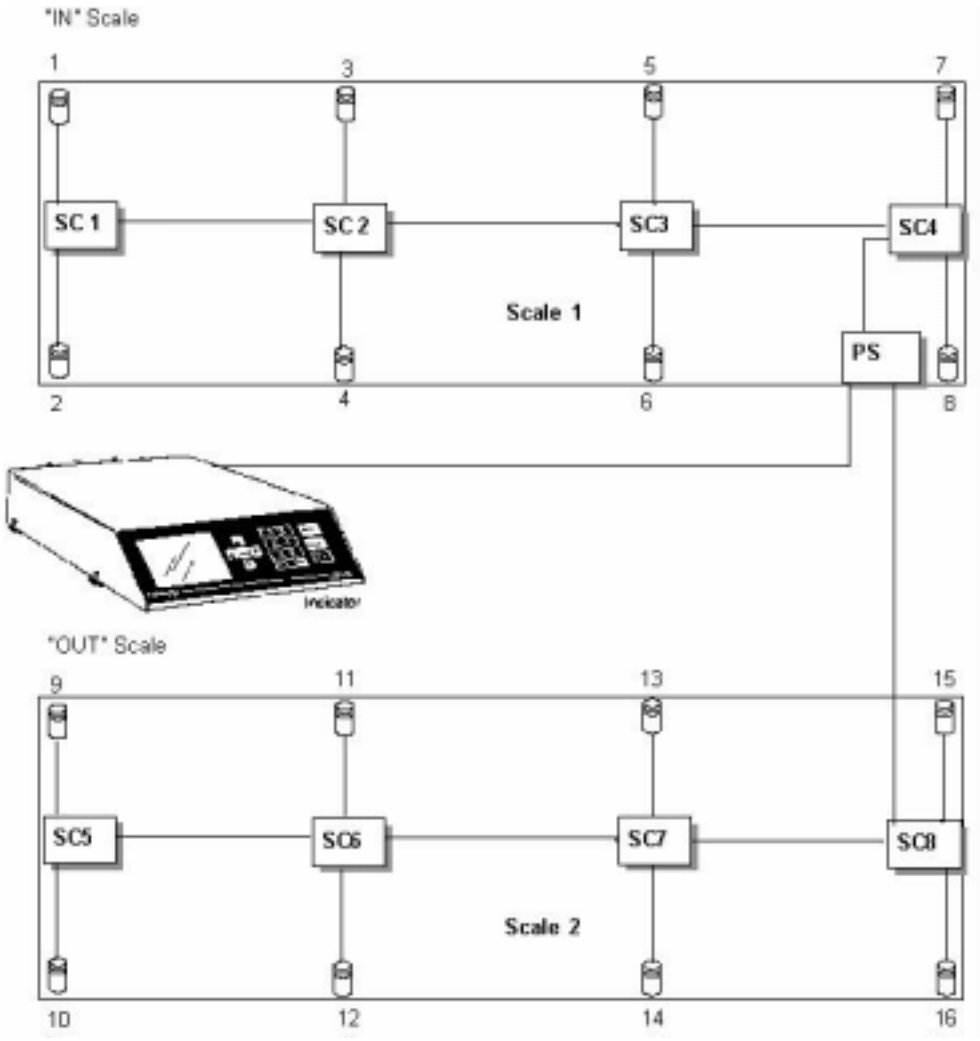


Appendix X: Scale Systems

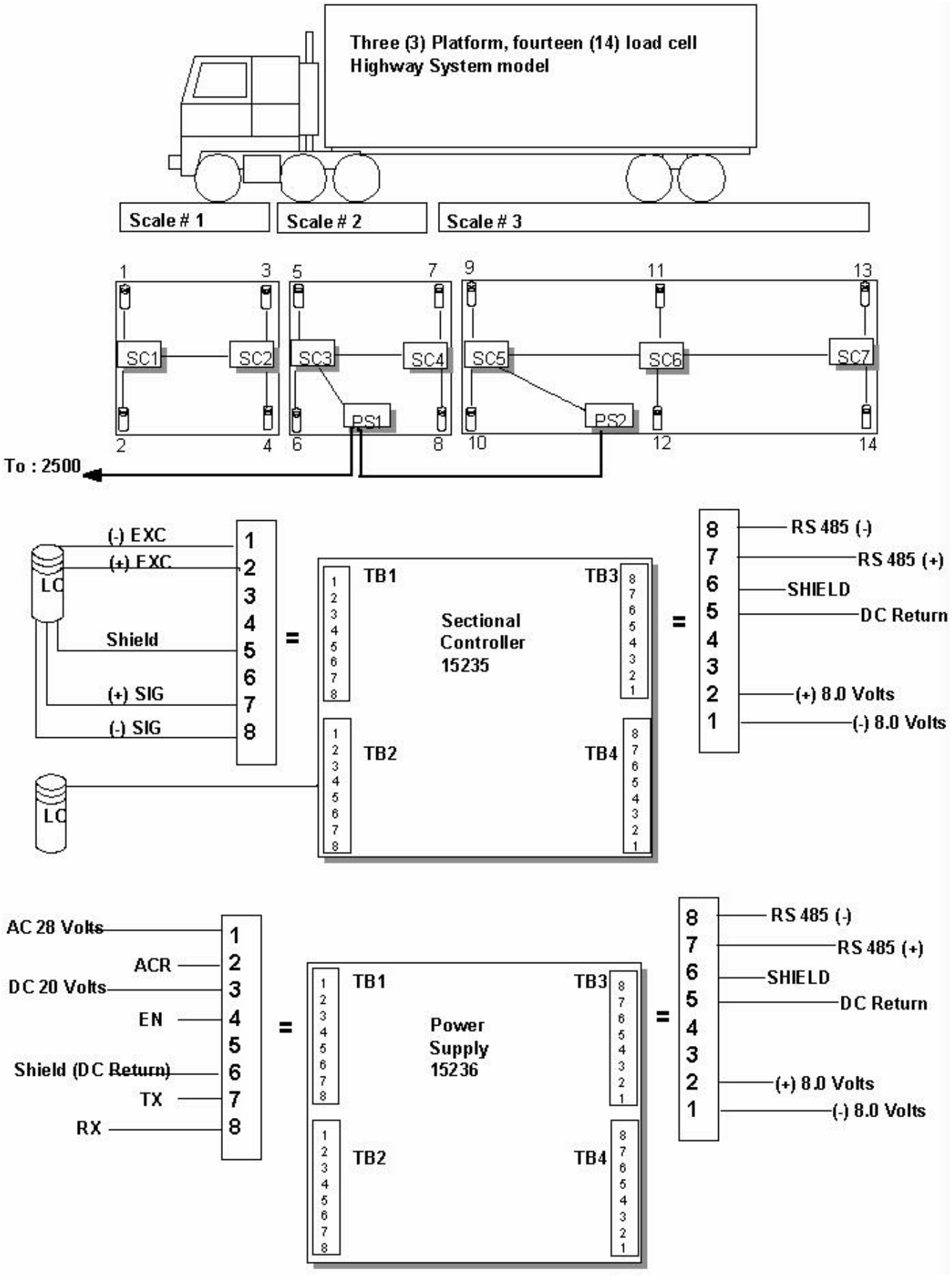
A: 1 Scale System



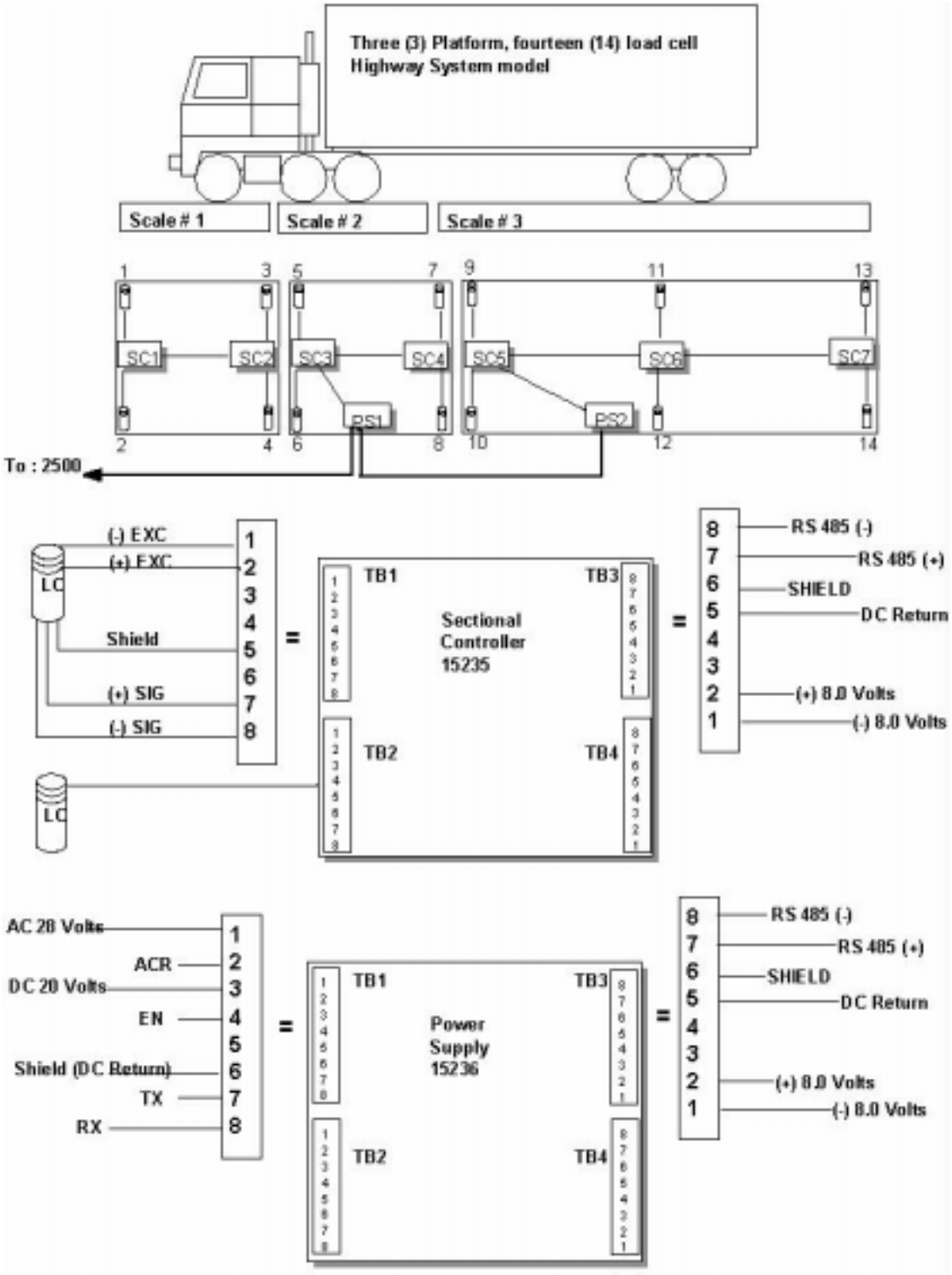
B: 2 Scale System



C: 3 Scale System



D: Highway System 3 Scale, 2 power supply wiring.

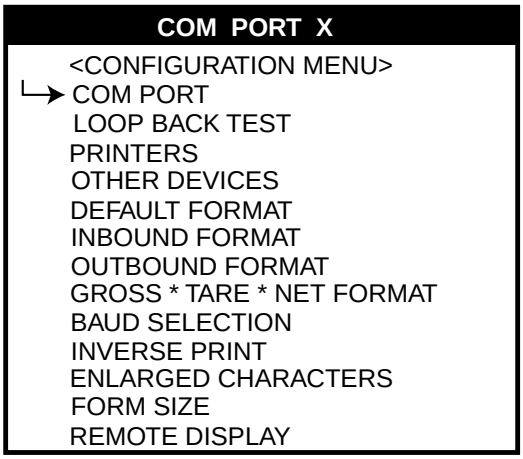


Appendix XI: 2500 tester

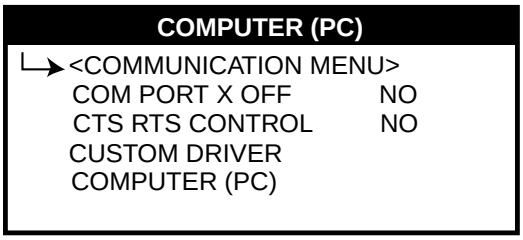
For additional Testing & Troubleshooting information
refer to manual 50526, 2500 Tester.

The 2500 tester is only for use in finding communications problems. Perform voltage and resistance checks before connecting the 2500 tester into a system or to a PCB or damage will occur.

Appendix XII: Computer Output modifications



OTHER DEVICES
Selects the COMPUTER (PC) menu as seen below.



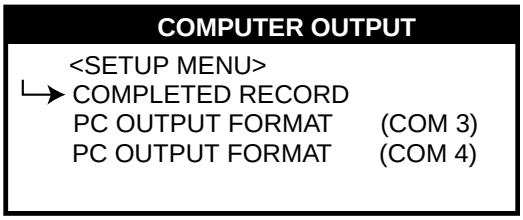
<COMMUNICATIONS MENU>
This selection will return to the **COM PORT X** menu.

COM PORT X OFF
This selection turns com port off

CTS RTS CONTROL
Pressing the enter key will toggle the selection from **YES** to **NO** allowing the selection of hardware or software handshaking.

CUSTOM DRIVER
This selection is used for the setup of a custom printer driver.

COMPUTER (PC)
This selection allows entry into the **COMPUTER OUTPUT** menu as seen below.

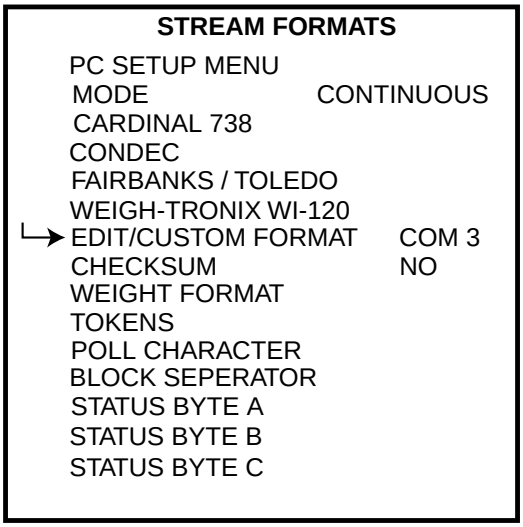


<SETUP MENU>
This selection will return to the **COMPUTER (PC)** menu.

COMPLETED RECORDS
(Available only from com port 2) This selection will cause the completed record to be transmitted upon completion of an incomplete or stored tare transaction. Data is in ASCII, comma delimited format. Data is sent as shown in subsection D of this appendix.

PC OUTPUT FORMAT (COM 3)
This selection allows entry into the **STREAM FORMATS** menu as shown below.

PC OUTPUT FORMAT (COM4)
This selection allows entry into the **STREAM FORMATS** menu as shown below.



PC SETUP MENU
This selection will return you to the **COMPUTER OUTPUT** menu.

MODE
Pressing the enter key will toggle through the following selections:

1. CONTINUOUS - Data is transmitted all the time, see section A of this appendix for details.

2. AUTO - Data is transmitted when an Inbound, Outbound, or GTN ticket is printed, see section C of this appendix for details.

3. DEMAND - Data is transmitted when the 2500 instrument receives the proper Poll Character in ASCII format from the receiving computer. The default Poll Character is a carriage return (decimal 13). Selecting the DEMAND mode will also enable the indicator to receive either a remote Print or Zero command from the computer. If the indicator receives a capital P it will initiate a PRINT cycle, like wise if the indicator receives a capital Z it will perform a ZERO function. See section B of this appendix for details.

CARDINAL 738
This selection will cause the indicator to output the standard data string of the Cardinal 738 instrument.

CONDEC
This selection will cause the indicator to output the standard data string of the Condec instrument.

FAIRBANKS / TOLEDO
This selection will cause the indicator to output the standard data string for the Fairbanks or Toledo instruments.

WEIGH-TRONIX W1-120
This selection will cause the indicator to output the standard data string of the Weigh-tronix WI-120 instrument.

EDIT/CUSTOM FORMAT COM X
This selection will allow access to the EDIT/CUSTOM FORMAT menu as detailed in section E of this appendix. See example in section H of this appendix

CHECKSUM
Pressing enter at this item will cause a toggle from ON to OFF. It controls whether a checksum character is sent at the end of the computer output.

WEIGHT FORMAT
This selection will allow access to the WEIGHT TOKENS menu as detailed in section F of this appendix.

TOKENS
This selection will allow access to the STREAM TOKENS menu as detailed in section G of this appendix.

POLL CHARACTER
Pressing the enter key at this item will allow you to toggle through several default values for the polling character, or you may also type in the decimal equivalent.

1. CR
2. ^@
3. SPACE
4. STX
5. ENQ

BLOCK SEPARATOR
Pressing the enter key at this item will allow you to toggle through several default values for the data block separator , or you may also type in the decimal equivalent.

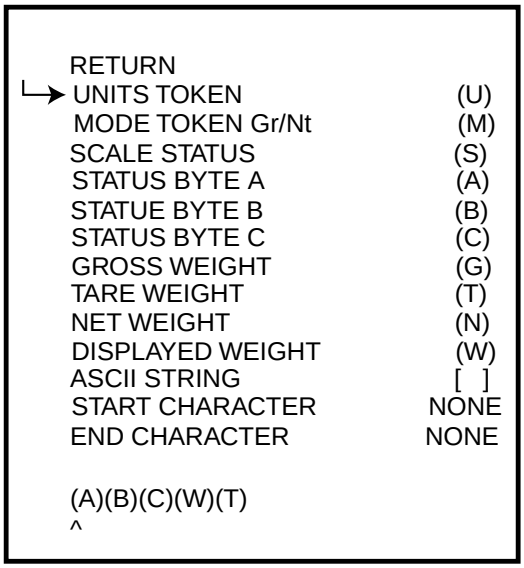
1. SPACE
2. CR
3. LF
4. CRLF
5. Blank
6. NONE

WARNING!
Modification of Status Byte A, B, or C should only be done at the direction of Technical Services or Engineering.

STATUS BYTE A
Selecting this item will allow entry into the BIT FIELDS menu for status byte A.

STATUS BYTE B
Selecting this item will allow entry into the BIT FIELDS menu for status byte B.

STATUS BYTE C
Selecting this item will allow entry into the BIT FIELDS menu for status byte C.



RETURN
This selection will return you to the STREAM FORMATS menu.

NOTE: The selections below will be reflected as an entry in the data string as seen at the bottom of the instrument display. The **highlighted** section with the ^ under the leading digit is the place where the selected data bit will be inserted. By use of the < and > arrow keys the highlighted area can be moved to the needed location in the data string.

UNITS TOKEN
Allows the entry of a units token such as lb or kg in the data string. Note this only works for lb, kg, or lb/kg.

MODE TOKEN Gr/Nt
Allows the entry of a mode token such as GR or NT in the data string. Note this only works for GR or NT.

SCALE STATUS
Allows the entry of a motion bit as shown by a capital M in the data string at the point of insertion.

WARNING!
Modification of Status Byte A, B, or C should only be done at the direction of Technical Services or Engineering.

STATUS BYTE'S A, B, C
Allows for the entry of grouped conditional states. These status bytes should only be changed or modified with the assistance of Technical Services.

GROSS WEIGHT
Allows the selection of just the gross weight. Note that **lbGR** will be transmitted after the weight regardless of that weight unit or legend is displayed at the instrument.

TARE WEIGHT
Allows the selection of just the tare weight. Note that **lbGR** will be transmitted after the weight regardless of that weight unit or legend is displayed at the instrument.

NET WEIGHT
Allows the selection of just the net weight. Note that **lbGR** will be transmitted after the weight regardless of that weight unit or legend is displayed at the instrument.

DISPLAYED WEIGHT
Allows the transmission of the gross or net weight depending on which is displayed at the instrument. Note that no units or weight legends are transmitted.

ASCII STRING
Allows the entry of an ASCII text string into the data stream.

START CHARACTER
Inserts the start character if required, or can be removed by selecting none.

END CHARACTER
Inserts the end character if required, or can be removed by selecting none.

RETURN
This selection will return you to the STREAM FORMATS menu.

WEIGHT DIGITS
Allows the selection of either 5, 6, or 7 characters of displayed weight in the data string/

LEADING ZEROS
Pressing the enter key at this selection item will cause a YES or NO toggle to allow for leading zero's in the data string to be included or excluded in the data string.

POLARITY INCLUSION
Pressing the enter key at this selection item will cause a YES or NO toggle to allow for inclusion of a polarity bit at the beginning of the data string.

DECIMAL POINT
This selection allows for the placement of a decimal point. Pressing enter will toggle throughout the following selections:

1. NONE
2. Floating
3. Fixed
4. Trailing

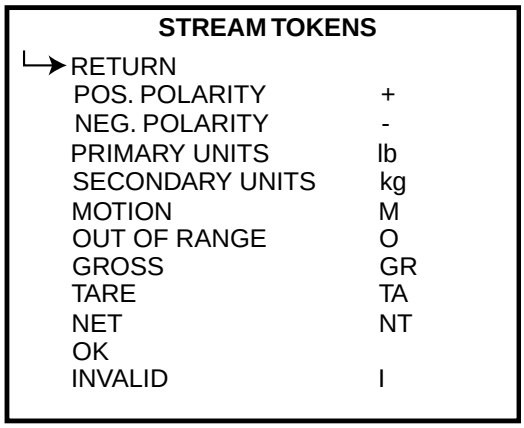
FIXED DECIMAL PLACES
This selection allows for the placement of a fixed decimal places. Pressing enter will allow the keyed entry of the required number of places.

JUSTIFICATION
Pressing the enter key at this selection will toggle from the weight data justification from RIGHT to LEFT as seen in the transmitted data string with reference to any leading or trailing zero's.

TEST WEIGHTS
Allows the keyed in entry of a weight value as seen at the bottom of the instrument display for comparison purposes.

+000000
The weight as entered from the above menu item, used for comparison purposes.

Section G
TOKENS



RETURN
This selection will return you to the STREAM FORMATS menu.

NOTE: The following below items allow for the customization of a selected stream item.

POS. POLARITY
Pressing the enter key here will cause a toggle between the following selections:

1. +
2. None
3. Space

NEG. POLARITY
Pressing the enter key here will cause a toggle between the following selections:

1. -
2. None
3. Space

PRIMARY UNITS
This selection allows for the ability to have a keyed entry for this field.

SECONDARY UNITS
This selection allows for the ability to have a keyed entry for this field.

MOTION
This selection allows for the ability to have a keyed entry for this field.

OUT OF RANGE
This selection allows for the ability to have a keyed entry for this field.

GROSS
This selection allows for the ability to have a keyed entry for this field.

TARE
This selection allows for the ability to have a keyed entry for this field.

NET
This selection allows for the ability to have a keyed entry for this field.

OK
This selection allows for the ability to have a keyed entry for this field.

INVALID
This selection allows for the ability to have a keyed entry for this field.

Section H
EXAMPLE

To create a simple data string that consists <start of text><displayed weight><end of text>, you would perform the following steps.

1. From the weigh screen press the MENU key.

2. Move the arrow to CONFIGURATION MENU and press the enter key.

3. Move the arrow to COMMUNICATION PORT and press the enter key.

4. Move the arrow to OTHER DEVICES and press the enter key.

5. Move the arrow to COMPUTER (PC) and press the enter key.

6. Move the arrow to PC OUTPUT FORMAT (COM 3 or 4) and press the enter key.

7. Move the arrow to EDIT/CUSTOM FORMAT (COM 3 or 4) and press the enter key.

8. Move the arrow to START CHARACTER and by repeatedly pressing the enter key toggle selections to STX.

9. Move the arrow to END CHARACTER and by repeatedly pressing the enter key toggle selections to ETX.

10. Move the arrow to DISPLAYED WEIGHT and press the enter key. Note that the data string seen at the bottom of the instrument display now looks like this (W)^ .

11. Exit to the weigh screen by pressing the MENU key several times. Note that when the scale output is viewed from hypertrm in windows it now looks like this n+030280