Seedburo®
Equipment Company

Model SB900 Operating Instructions

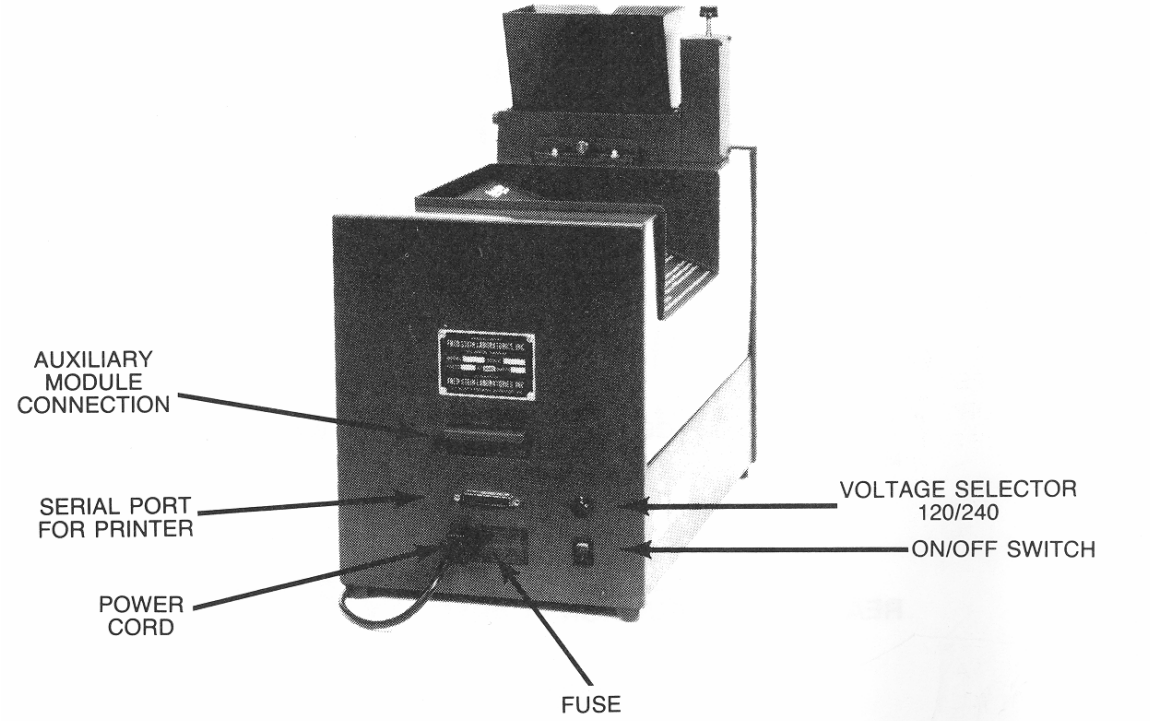
OPERATING INSTRUCTIONS

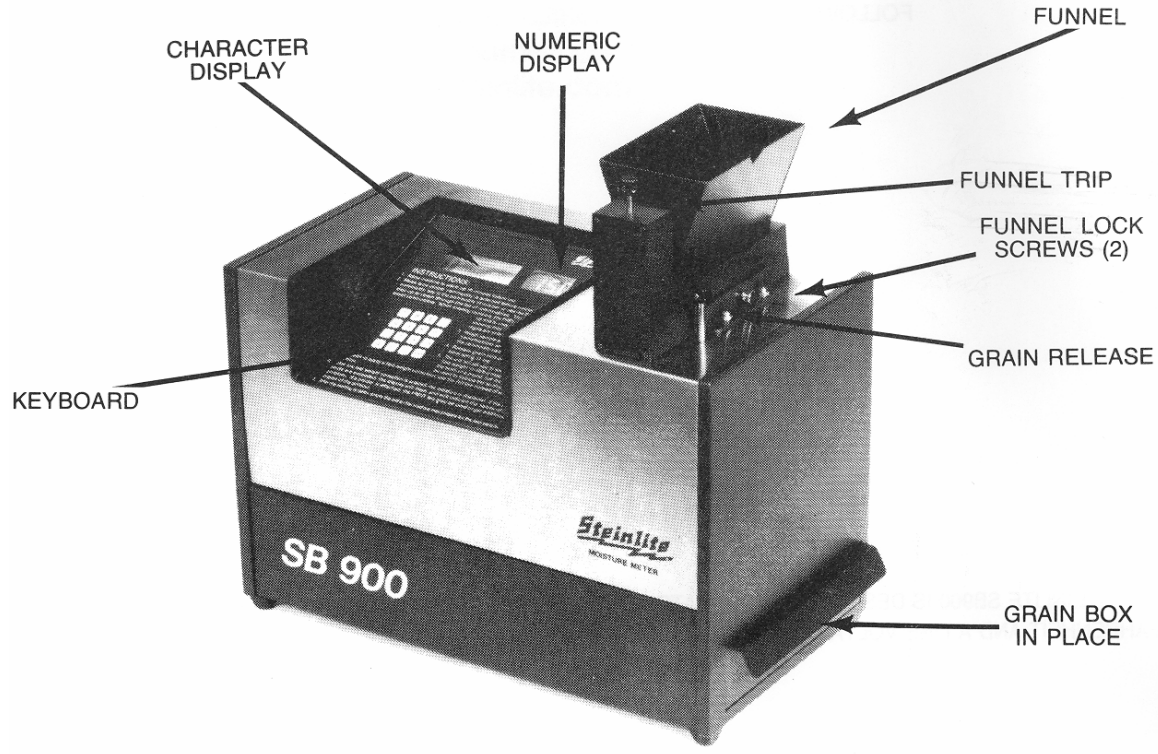
THE FOLLOWING PAGES INDICATE THE CORRECT WAY TO MAKE A MOISTURE TEST ON THE MODEL SB900.

READ THE INSTRUCTIONS CAREFULLY

SATISFACTORY MOISTURE TESTS CAN BE MADE ONLY BY FOLLOWING THE INSTRUCTIONS.

THE STEINLITE SB900 IS DESIGNED TO OPERATE IN AN AMBIENT TEMPERATURE RANGE OF 60 TO 90 DEGREES FAHRENHEIT AND A LINE VOLTAGE OF 110 TO 120 AND 220 TO 240 VOLTS A.C. 50-60 CYCLES.


AUXILIARY MODULE CONNECTION
SERIAL PORT FOR PRINTER
POWER CORD
FUSE
VOLTAGE SELECTOR 120/240
ON/OFF SWITCH

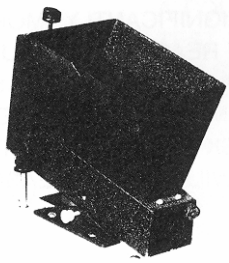

CHARACTER DISPLAY
NUMERIC DISPLAY
FUNNEL
FUNNEL TRIP
FUNNEL LOCK SCREWS (2)
KEYBOARD
GRAIN RELEASE
SB 900
Steinlite
GRAIN BOX IN PLACE

WHEN YOU RECEIVE THE SB900

FAMILIARIZE LOOK AT THE DIAGRAMS AND FAMILIARIZE YOURSELF WITH THE BASIC COMPONENTS.

FUNNEL THE FUNNEL IS NOT ATTACHED TO THE UNIT DURING SHIPMENT, IT WILL BE NECESSARY FOR YOU TO ATTACH IT AS SHOWN BELOW. THE WEIGHED COMMODITY BEING TESTED IS POURED INTO THIS FUNNEL, WHERE IT CAN BE RELEASED INTO THE CELL.

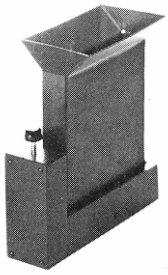
GRAIN FUNNEL



FUNNEL PLACEMENT

PRESS THE FUNNEL AGAINST FUNNEL STOP. LOWER FUNNEL TO PANEL AND TIGHTEN FUNNEL LOCK SCREWS. PRESS THE KNOB ON THE FUNNEL TO OPEN ITS DOOR. ADJUST THE FUNNEL LOCK SCREWS SO THAT THERE IS MINIMAL OVERLAP BETWEEN THE FUNNEL BASE AND THE HOLE IN THE TOP PANEL BELOW IT.

NUT FUNNEL



VOLTAGE BEFORE PLUGGING IN THE UNIT ENSURE THAT THE VOLTAGE SELECTOR IS SET TO THE PROPER VOLTAGE.

DISPLAYS NOTICE THAT THERE ARE TWO DISPLAYS ABOVE THE KEYBOARD. THE LEFT HAND DISPLAY IS A CHARACTER DISPLAY USED TO SHOW COMMODITY SELECTION AND TO SHOW VARIOUS USER PROMPTS. FOR FURTHER INSTRUCTION ON THIS DISPLAY SEE SECTION ON **'MESSAGES AND USER PROMPTS'.**
THE RIGHT HAND DISPLAY IS NUMERIC ONLY AND IS USED TO SHOW PERCENT MOISTURE READINGS.

KEYBOARD THE KEYBOARD CAN BE USED TO ENTER COMMODITY IDENTIFICATION CODES, TEST WEIGHTS AND TO SCROLL FUNCTIONS. FOR FURTHER INSTRUCTION ON KEYBOARD USE SEE SECTION TITLES **'ENTERING NUMBERS'** AND **'MODES'.**

CHECKING FUNCTIONS

NOTE: AFTER THE SB900 IS INITIALLY TURNED ON, ALLOW A FIFTEEN MINUTE WARM-UP PERIOD BEFORE TAKING MOISTURE READINGS.

POWER UP

WHEN THE UNIT IS FIRST TURNED ON, ITS SERIAL NUMBER WILL BE SHOWN IN THE LEFT HAND (L.H.) DISPLAY FOR A MOMENT. DURING THIS TIME THE RIGHT HAND (R.H.) DISPLAY WILL SHOW '88.8'. IF THESE NUMERALS DO NOT SHOW, THEN THE DISPLAY IS NOT FUNCTIONING PROPERLY AND THE UNIT SHOULD NOT BE USED.

ZEROING/ BALANCE

THE UNIT NEXT 'ZEROS' ITSELF. DURING THIS PROCEDURE THE L.H. DISPLAY WILL SHOW **'BALANCING'.** THE UNIT IS BALANCED WHEN THE R.H. DISPLAY SHOWS '15.0' AND THEN THE UNIT CONTINUES TO THE NEXT STEP. IF THE BALANCE NUMBER DIFFERS SIGNIFICANTLY (MORE THAN 1.5) OR IF THE BALANCE NUMBER DOES NOT REACH 15.0 THE UNIT WILL REQUIRE SERVICE. THIS READING DOES CHANGE RELATIVELY SLOWLY, SO THE PROCEDURE MAY TAKE AWHILE (AS MUCH AS 1 MINUTE). IF THE UNIT DETECTS GRAIN IN THE CELL, IT WILL ASK YOU TO EMPTY THE CELL BEFORE IT ZEROS ITSELF. THE L.H. DISPLAY WILL SHOW **'PLEASE EMPTY CEL'.**

SELECTING COMMODITIES

THE UNIT THEN PROMPTS YOU TO SELECT THE APPROPRIATE COMMODITY BY SHOWING **'SELECT COMMODITY'** IN THE L.H. DISPLAY. COMMODITY SELECTION MAY BE DONE BY KEYING IN THE COMMODITY 3-DIGIT IDENTIFICATION CODE (FOR A LIST OF THE STANDARD COMMODITY CALIBRATIONS BUILT INTO THE SB900 SEE BACK COVER) OR BY USING THE **'PREV'** AND **'NEXT'** KEYS. FURTHER KEYBOARD INSTRUCTION WILL BE DISCUSSED ON THE FOLLOWING PAGES.

AFTER THE COMMODITY IS SELECTED THE UNIT ZEROS ITSELF AGAIN, THIS WILL SHOW ON THE L.H. DISPLAY FOR 5-10 SECONDS.

IF THE SB900 HAS COMPLETED ITS WARM-UP PERIOD OF 15 MINUTES IT CAN NOW BE USED FOR NORMAL OPERATION.

AUTO ZERO

DURING NORMAL OPERATION THE UNIT ZEROS ITSELF AUTOMATICALLY WHEN THE CELL HAS BEEN EMPTY FOR SHORT PERIODS OF TIME - 30 TO 60 SECONDS. THIS WILL NOT SHOW ON THE DISPLAY. **FOR THIS REASON THE CELL SHOULD BE EMPTIED AFTER A READING IS TAKEN SO THAT THE UNIT "IDLES" WITH AN EMPTY CELL.** THE TIME SPENT BETWEEN MOISTURE READINGS (WEIGHING SAMPLES AND WRITING DOWN WEIGHTS FOR EXAMPLE) WILL BE MORE THAN ENOUGH TIME TO ALLOW THE SB900 TO ZERO ITSELF AUTOMATICALLY.

ENTERING NUMBERS

COMMODITY I.D./ TEST WEIGHT

NUMBERS SUCH AS THE COMMODITY IDENTIFICATION CODE AND THE TEST WEIGHT CONSIST OF THREE DIGITS. THE L.H. DISPLAY WILL SHOW '**SELECT COMMODITY**'. AFTER THE FIRST NUMERAL OF THE COMMODITY IDENTIFICATION CODE IS ENTERED THE L.H. DISPLAY WILL SHOW '**ENTER I.D.#**' AND THE NUMBER THAT WAS INTITIALLY ENTERED. YOU CAN NOW ENTER THE REMAINING DIGITS OF THE IDENTIFICATION CODE AND IT WILL SHOW THIS ON THE L.H. DISPLAY AS THEY ARE ENTERED.
WHEN THE L.H. DISPLAY SHOWS '**ENTER TW**' YOU CAN ENTER THE TEST WEIGHT. THIS WEIGHT IS POUNDS PER BUSHEL OF A PARTICULAR COMMODITY.

DECIMAL POINT

THE LAST DIGIT OF THE TEST WEIGHT IS THE TENTHS OF A POUND AND THE DECIMAL POINT AUTOMATICALLY APPEARS IN THE L.H. DISPLAY TO INDICATE THIS. KEYING IN THE THIRD DIGIT WILL ENTER THE TENTHS OF A POUND. THE OPERATOR NEED NOT ENTER ALL THREE DIGITS OF A TEST WEIGHT FOR THE SB900 TO ACCEPT IT. BY KEYING IN THE FIRST AND SECOND NUMERALS IN THE TEST WEIGHT AND PRESSING '**GO**' YOUR ENTRY WILL BE ACCEPTED. IN THIS CASE THE SB900 WILL ASSUME THE UNENTERED DIGIT FOR TENTHS IS A ZERO.

PREV KEY

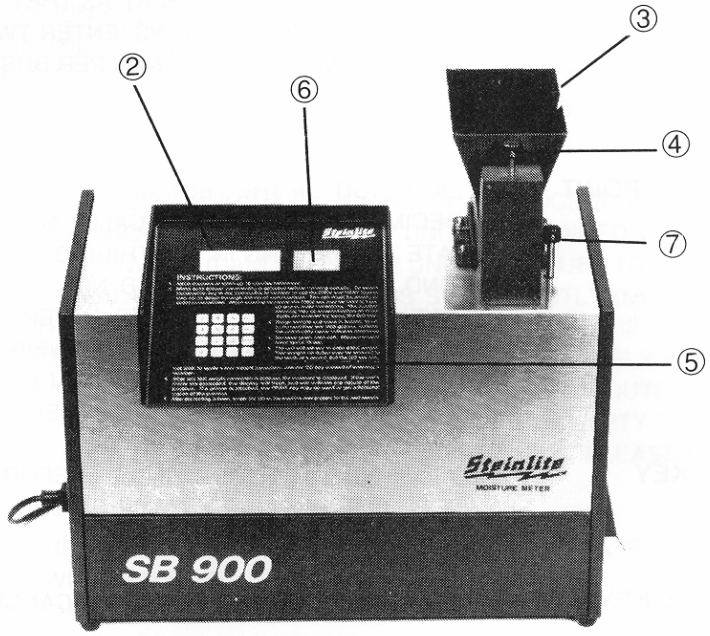
'PREV' STANDS FOR 'PREVIOUS'. BEFORE ALL THREE DIGITS ARE ENTERED THE '**PREV**' KEY MAY BE USED TO CHANGE AN INCORRECT DIGIT.

CANCEL KEY

THE '**CANCEL**' KEY MAY BE USED TO CANCEL A NUMERIC ENTRY.

MOISTURE TEST PROCEDURE

BRIEFLY, A MOISTURE TEST WITH THE STEINLITE SB900 CONSISTS OF WEIGHING A SAMPLE, POURING IT INTO THE FUNNEL AND RELEASING IT INTO THE CELL. AN ELECTRONIC TIMER CONTROLS A TIME PERIOD OF 15-20 SECONDS FOR AUTOMATIC TEMPERATURE CORRECTION. A MOISTURE CONTENT READING APPEARS IN THE R.H. DISPLAY. THIS IS THE PERCENTAGE OF MOISTURE FOR THAT COMMODITY.



MOISTURE TEST PROCEDURE

1. ALLOW SB900 TO WARM-UP FOR 15 MINUTES AFTER IT IS TURNED ON.
2. MAKE SURE PROPER COMMODITY IS SELECTED BEFORE RUNNING SAMPLE. TO SELECT COMMODITY, KEY IN THE COMMODITY IDENTIFICATION CODE FOUND ON THE BACK COVER OR USE THE **'PREV'** AND **'NEXT'** KEYS TO STEP UP OR DOWN THROUGH THE LIST OF BUILT-IN COMMODITIES. THE CELL MUST BE EMPTY TO SELECT COMMODITIES. WHEN ENTERING NUMBERS, THE **'PREV'** KEY CAN BE USED TO BACK UP AND MAKE CORRECTIONS.
3. WEIGH SAMPLE AND PLACE IN FUNNEL. MOST COMMODITIES ARE 250 GRAMS, UNLESS OTHERWISE INDICATED IN THE COMMODITY NAME. SEE BACK COVER OF THIS MANUAL FOR SAMPLE WEIGHTS.
4. RELEASE GRAIN INTO CELL. MEASUREMENT TAKES APPROXIMATELY 15 SECONDS.
5. THE UNIT WILL ASK YOU TO ENTER A TEST WEIGHT FOR THOSE COMMODITIES REQUIRING A TEST WEIGHT CORRECTION. TEST WEIGHT, IN POUNDS PER BUSHEL, MAY BE ENTERED TO THE TENTH OF A POUND, BUT THE **'GO'** KEY CAN BE USED TO BYPASS THE TENTHS.

IF YOU DON'T WISH TO APPLY A TEST WEIGHT CORRECTION, USE THE **'GO'** KEY INSTEAD OF ENTERING A NUMBER.

6. AFTER ANY TEST WEIGHT CORRECTION IS ENTERED, THE MOISTURE PERCENTAGE IS SHOWN IN THE R.H. DISPLAY. **IF THE UNIT'S LIMITS ARE EXCEEDED, THE MOISTURE READING WILL FLASH** AND THE L.H. DISPLAY WILL INDICATE THE NATURE OF THE PROBLEM. IF A PRINTER IS ATTACHED, A COPY AUTOMATICALLY IS PRINTED EVERY TIME A MOISTURE READING APPEARS. FOR ADDITIONAL COPIES USE THE **'PRINT'** KEY.
7. AFTER THE READING IS TAKEN, EMPTY THE CELL SO THE SB900 CAN PREPARE FOR THE NEXT SAMPLE.

IMPORTANT POINTS TO CONSIDER WHEN OPERATING THE SB900

THE STEINLITE SB900 IS DESIGNED TO OPERATE IN AN AMBIENT TEMPERATURE RANGE OF 60 TO 90 DEGREES FAHRENHEIT AND A LINE VOLTAGE OF 110 TO 120 AND 220 TO 240 VOLTS A.C. 50-60 CYCLES.

THE WARM UP PERIOD FOR THE SB900 IS 15 MINUTES. AT THAT TIME THE THERMAL DRIFT IS REDUCED TO A MINIMUM.

CORN DOES NOT PACK UNIFORMLY EACH TIME IN THE CELL, ESPECIALLY AT HIGHER MOISTURES. FOR BEST RESULTS TAKE THREE READINGS AND USE THE AVERAGE OF THE THREE.

ANY OTHER GRAINS ABOVE 15 PERCENT MOISTURE CONTENT SHOULD HAVE TWO READINGS TAKEN USING THE AVERAGE OF THE TWO.

CAUTION

GRAIN OUTSIDE THE NORMALLY HARVESTED GRADE WILL NOT TEST CORRECTLY. SOME HARVEST SEASONS MAY CAUSE LIGHT TEST WEIGHT PER BUSHEL VALUES OF GRAIN COMING TO AN ELEVATOR. THIS MAY BE DUE TO IMPROPER MATURING IN THE FIELD OR WEATHER CONDITIONS AT A CRITICAL STAGE OF CROP DEVELOPMENT. WHATEVER THE REASON, THE ELECTRICAL PROPERTIES OF GRAIN ARE AFFECTED AND CONSEQUENTLY TESTS ON ELECTRONIC MOISTURE METERS WILL BE AFFECTED.

COLD SAMPLES

1. SAMPLES WHICH CONTAIN ICE OR SNOW CANNOT BE TESTED SATISFACTORILY.
2. FROZEN SAMPLES CAN BE TESTED IF ALLOWED TO WARM UP IN AN AIR TIGHT CONTAINER TO THE USEABLE LIMITS LISTED. USE AN AVERAGE OF THREE OR MORE READINGS.
3. AT THE LOW END OF THE TERMPERATURE RANGE TAKE TWO READINGS AND USE THE AVERAGE.

SURFACE MOISTURE

GRAIN HARVESTED DURING A RAINY PERIOD WILL CONTAIN SURFACE MOISTURE. ACCURATE READINGS CANNOT BE OBTAINED ON THE STEINLITE WHEN THIS OCCURS. SURFACE MOISTURE OFFERS A MUCH LOWER IMPEDANCE TO THE FLOW OF HIGH FREQUENCY CURRENT AND CONSEQUENTLY INACCURATE HIGH READINGS WILL BE OBTAINED.

TESTING COMMODITIES THAT REQUIRE A COMPRESSOR BLOCK

NONE OF THE CALIBRATIONS BUILT INTO THE SB900 REQUIRE A COMPRESSOR BLOCK AND FUNNEL. HOWEVER, CERTAIN CALIBRATIONS AVAILABLE ON THE AUXILIARY MODULE DO. CALL THE STEINLITE CORPORATION FOR INFORMATION ON THESE CALIBRATIONS AND TO OBTAIN THE SPECIAL FUNNEL AND COMPRESSOR BLOCK.

WHEN TESTING COMMODITIES (SUCH AS COTTONSEED, WHEAT MIDDLINGS AND SUGAR BEET PULP) THAT REQUIRE A COMPRESSOR BLOCK, THE FOLLOWING PROCEDURE MUST BE FOLLOWED.

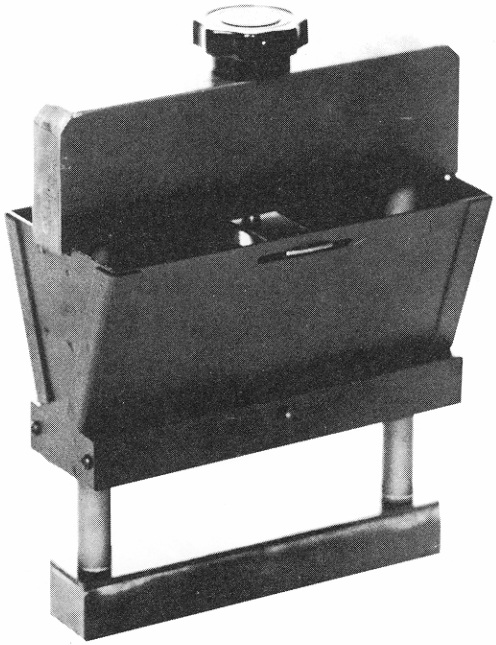
1. INSTALL THE SPECIAL FUNNEL.

2. KEY IN THE PROPER COMMODITY CODE OR SELECTION.

3. PRESS THE **'GO'** KEY. THE LCD DISPLAY WILL NOW SHOW **'LOAD CELL, HIT GO'.**

4. LOAD COMMODITY INTO FUNNEL AND COMPRESS WITH COMPRESSOR BLOCK. NOW PRESS **'GO'.**

5. WAIT THE USUAL 15-20 SECONDS FOR THE READING.



AUXILIARY MODULE

(optional)

AN AUXILIARY MODULE MAY BE PLUGGED INTO THE SIDE OF THE SB900 TO ADD CALIBRATIONS TO THOSE BUILT INTO THE UNIT ALREADY. THIS MODULE CAN HOLD UP TO 255 ADDITIONAL CALIBRATIONS, DEPENDING ON WHICH CALIBRATIONS ARE PROGRAMMED INTO THE MODULE. **YOU CAN SPECIFY** WHAT CALIBRATIONS WILL BE PROGRAMMED INTO THIS AUXILIARY MODULE. CONTACT THE STEINLITE CORPORATION FOR PRICES AND OTHER CALIBRATION INFORMATION.

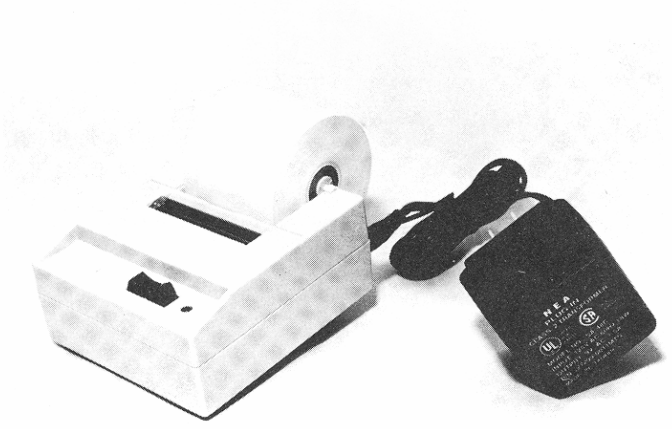
TO INSTALL, FIRST ASSURE THAT THE SB900 IS **TURNED OFF. DO NOT INSERT OR REMOVE THE MODULE UNLESS THE SB900 IS TURNED OFF!** DOING SO COULD DAMAGE THE SB900, THE AUXILIARY MODULE OR BOTH. THE MODULE SHOULD BE INSERTED PLUG END FIRST WITH THE HANDLE ON TOP SO THAT THE BENT PART OF THE HANDLE FACES DOWNWARDS. THE MODULE SHOULD BE PLUGGED IN ALL THE WAY, SO THAT THE FACE OF THE MODULE, EXCLUDING THE HANDLE IS FLUSH WITH THE CABINET. IT MAY BE NECESSARY TO WIGGLE THE MODULE ABOUT SLIGHTLY TO FIND THE CONNECTOR IN THE BACK.

THE MODULE WILL NOT GO IN ALL THE WAY UNTIL THE CONNECTORS ARE PROPERLY MATED. FAILURE TO INSERT THE MODULE ALL THE WAY WILL RESULT IN IMPROPER OPERATION, AND POSSIBLE DAMAGE TO THE UNIT OR THE MODULE.

PRINTER

(optional)

A PRINTER IS AVAILABLE THROUGH THE STEINLITE CORPORATION. SEE SECTIONS TITLED **'MODES'** AND **'PRINTER PORT'** FOR OTHER INFORMATION CONCERNING THE PRINTER.



ERROR MESSAGES AND USER PROMPTS

BELOW IS AN ALPHABETICAL LISTING OF THE MESSAGES AND PROMPTS USED BY THE SB900 TO AID THE USER. THESE WILL APPEAR IN THE LEFT HAND DISPLAY.

BAD CHECKSUM: INDICATES THAT THE SB900 HAS DISCOVERED A CORRUPTED CALIBRATION. IF THE COMMODITY IDENTIFICATION CODE SELECTED WAS IN THE AUXILIARY MODULE, MAKE SURE THAT IT IS PROPERLY PLUGGED IN. IF THIS DOESN'T FIX THE PROBLEM, EITHER THE AUXILIARY MODULE OR THE SB900 REQUIRES SERVICE.

BAD THERMISTOR: INDICATES THAT THE TEMPERATURE SENSOR IS BROKEN AND SERVICE IS REQUIRED.

BALANCING: DISPLAYED WHILE THE SB900 IS ZEROING ITSELF. THE READING SHOULD REACH 15.0 AND WHEN IT DOES THIS MESSAGE WILL DISAPPEAR. THE SB900'S PROGRAM WILL THEN PROCEED TO IT'S NEXT PHASE.

ENTER ID#: DISPLAYED AFTER THE FIRST DIGIT OF A COMMODITY IDENTIFICATION CODE IS KEYED. THIS IS FOLLOWED BY WHAT HAS BEEN KEYED IN SO FAR. THE COMMODITY ID CODE IS A UNIQUE IDENTIFICATION NUMBER FOR A PARTICULAR CALIBRATION.

ENTER TW: INDICATES THAT THE SB900 WANTS YOU TO KEY IN A TEST WEIGHT SO IT CAN MAKE A TEST WEIGHT CORRECTION BASED ON THIS NUMBER. KEY IN THE TEST WEIGHT, OR JUST PRESS **'GO'** TO USE THE 'NORMAL' TEST WEIGHT (NO CORRECTION APPLIED). TEST WEIGHT IS IN POUNDS PER BUSHEL.

INVFLT: INDICATES A PARTICULAR PROBLEM IN THE SB900. SERVICE IS REQUIRED.

LOAD CELL, HIT GO: DISPLAYED AFTER THE **'GO'** BUTTON IS PRESSED THE FIRST TIME FOR A COMPRESSOR BLOCK COMMODITY. AFTER THE COMMODITY IS LOADED AND COMPRESSED THE **'GO'** KEY SHOULD BE PRESSED AGAIN.

MCHECK: THIS IS FOLLOWED BY FOUR CHARACTERS. THIS INDICATES THAT THE SB900 HAS DETECTED A PROBLEM IN ITS PROGRAM AND SERVICE IS REQUIRED.

MOISTURE HIGH
MOISTURE LOW: INDICATES THAT PARTICULAR PARAMETER IS OUT OF RANGE. THE DISPLAYED MOISTURE READING WILL FLASH TO INDICATE THAT IT POSSIBLY IS AN INACCURATE MEASURE OF THE MOISTURE, BECAUSE A LIMIT OF THE CALIBRATION HAS BEEN EXCEEDED. IF MORE THAN ONE LIMIT HAS BEEN EXCEEDED, THE MESSAGES WILL BE SHOWN ONE AFTER THE OTHER.

NO CAL SELECTED: INDICATES THAT THE SB900 CANNOT FIND THE PARTICULAR CALIBRATION WHOSE IDENTIFICATION CODE IS CURRENTLY ENTERED. SINCE THE SB900 ORDINARILY STAYS ON THE PREVIOUS CALIBRATION, IF THE NEW IDENTIFICATION CODE IS NOT FOUND THIS MESSAGE WILL NOT NORMALLY APPEAR. A POSSIBLE CAUSE WOULD BE TO UNPLUG THE AUXILIARY MODULE WHILE A CALIBRATION IN THE MODULE WAS SELECTED. THE AUXILIARY MODULE SHOULD NOT BE PLUGGED IN OR UNPLUGGED WHILE THE SB900 IS **ON,** BECAUSE DAMAGE COULD RESULT.

PLEASE EMPTY CEL: INDICATES THAT THE SB900 HAS DETECTED GRAIN IN THE CELL AND IS ASKING YOU TO EMPTY IT SO IT CAN ZERO ITSELF. IF THERE IS NO GRAIN IN THE CELL THEN THE SB900 NEEDS SERVICE.

RAMBAD: THE SB900 HAS DISCOVERED A PROBLEM WITH ITS DATA STORAGE MEMORY AND REQUIRES SERVICE.

SELECT COMMODITY: DISPLAYED AFTER SB900 IS TURNED ON TO REMIND YOU TO SELECT THE APPROPRIATE COMMODITY BEFORE USING THE UNIT.

SER#: DISPLAYED WHEN THE UNIT IS FIRST TURNED ON, FOLLOWED BY THE UNIT SERIAL NUMBER.

TEMPERATURE HIGH
TEMPERATURE LOW
TEST WEIGHT HIGH
TEST WEIGHT LOW: INDICATES THAT PARTICULAR PARAMETER IS OUT OF RANGE. THE DISPLAYED MOISTURE READING WILL FLASH TO INDICATE THAT IT POSSIBLY IS AN INACCURATE MEASURE OF THE MOISTURE, BECAUSE A LIMIT OF THE CALIBRATION HAS BEEN EXCEEDED. IF MORE THAN ONE LIMIT HAS BEEN EXCEEDED, THE MESSAGES WILL BE SHOWN ONE AFTER THE OTHER.

MODES

USING THE **'MODE'** KEY

MANY OF THE LESSER USED FUNCTIONS OF THE SB900 ARE ACCESSED BY THE **'MODE'** KEY. WHEN THE **'MODE'** KEY IS PRESSED, A LIST OF OPTIONS IS PRESENTED. THE FIRST OPTION SHOWS ON THE DISPLAY, AND YOU MAY STEP THROUGH THE LIST USING THE **'NEXT'** AND **'PREV'** KEYS. WHEN THE DESIRED OPTION IS SHOWING ON THE L.H. DISPLAY PRESS THE **'GO'** KEY TO SELECT IT. BY PRESSING THE **'GO'** KEY THE FUNCTION SELECTED WILL BE ENABLED OR A FURTHER LIST OF OPTIONS WILL BE PRESENTED.

THE **'CANCEL'** KEY MAY BE USED TO BACK OUT TO A PREVIOUS LIST. **ALL SETTINGS MADE BY THE 'MODE' KEY ARE LOST WHEN THE SB900 IS TURNED OFF.** A DESCRIPTION OF THE FUNCTIONS FOLLOWS.

1. BALANCE THE UNIT: **'MODE:BALANCE'** ZEROS THE SB900. DURING NORMAL OPERATION THE SB900 ZEROS ITSELF AUTOMATICALLY WHEN THE CELL IS EMPTY. **THIS IS A BACK-UP WAY TO ASSURE THAT THE UNIT IS ZEROED, AND IS NOT USUALLY NECESSARY.**
   PRESS **'GO'** TO START ZEROING PROCESS.

2. LIST CALIBRATIONS: **'MODE:LIST'** ALLOWS YOU TO DISPLAY AND OR PRINT A COMPLETE LIST OF ALL THE COMMODITIES ON THE SB900, AND THEIR COMMODITY IDENTIFICATION CODE. OPTIONS ARE TO SEND THE LISTING TO THE L.H. DISPLAY **(MODE:LIST:LCD)** OR THE PRINTER **(MODE:LIST:SER)** OR TO BOTH **(MODE:LIST:BOTH).** USE THE **'PREV'** AND THE **'NEXT'** KEYS TO FIND YOUR CHOICE AND THE **'GO'** KEY TO ENABLE THAT CHOICE.
   THIS FUNCTION LISTS ALL THE CALIBRATIONS INSTALLED ON THE SB900, BOTH INTERNAL AND ON THE AUXILIARY PLUG-IN MODULE.

3. SERIAL PORT SET-UP: **'MODE:SER'** ALLOWS YOU TO HOOK UP A DEVICE TO THE PRINTER PORT THAT HAS DIFFERENT PARAMETERS THAN THE DEFAULTS OF THE SB900 (WHICH ARE 1200 BAUD, NO PARITY, 8 BITS, 2 STOP BITS). THESE OPTIONS MAY BE USED TO CHANGE THE PARAMETERS. IT IS USUALLY MORE CONVENIENT TO CHANGE THE PARAMETERS ON THE OTHER DEVICE BECAUSE THE SETTINGS ON THE SB900 WILL BE LOST EACH TIME THE UNIT IS SWITCHED OFF. IF IT IS NECESSARY THOUGH, THE PARAMETERS MAY BE CHANGED ON THE SB900.
   'MODE:SER:BD' ALLOWS YOU TO SET THE BAUD RATES. USE THE **'NEXT'** AND **'PREV'** KEYS TO FIND THE CORRECT RATE AND THE **'GO'** KEY TO ENABLE THAT SELECTION.
   'MODE:SER:PAR' IS THE PARITY. OPTIONS ARE NO PARITY **(NO),** EVEN PARITY **(EVN)** OR ODD PARITY **(ODD).** USE THE **'PREV'** AND THE **'NEXT'** KEYS AND THE **'GO'** KEY TO MAKE YOUR SELECTION.
   'MODE:SER:BITS' LETS YOU SET THE NUMBER OF BITS TO SEVEN (7) OR EIGHT (8), AS DESIRED.
   'MODE:SER:STOP' ALLOWS YOU TO SELECT ONE (1) OR TWO (2) STOP BITS.

SERIAL PORT INTERFACING IS A SOMEWHAT TECHNICAL SUBJECT, A COMPLETE DISCUSSION OF WHICH IS OUTSIDE THE SCOPE OF THIS MANUAL. THOSE USING THE PRINTER, AVAILABLE THROUGH THE STEINLITE CORPORATION, NEED TO DO NO MORE THAN HOOK THE PRINTER CABLE SUPPLIED BETWEEN THE PRINTER AND SB900, TURN ON THE UNIT, THEN THE PRINTER AND PRINT AWAY.
MORE INFORMATION ON THE SERIAL PORT IS PRESENTED UNDER THE PAGE TITLED **'PRINTER PORT (SERIAL PORT)'.**

PRINTER PORT (SERIAL PORT)

NOTE: THE FOLLOWING IS FOR INFORMATIONAL PURPOSES ONLY. CONTACT YOUR LOCAL COMPUTER OUTLET FOR TECHNICAL ASSISTANCE IN HOOKING YOUR COMPUTER TO THE SB900.

THE PRINTER PORT IS A SERIAL PORT (LIKE RS-232) THAT SHOULD INTERFACE TO MOST COMPUTERS THAT HAVE AN RS-232 SERIAL PORT AND TO MOST PRINTERS THAT HAVE SUCH A SERIAL PORT. MANY PRINTERS FOR COMPUTERS USE A PARALLEL PORT ONLY, AND THESE WILL NOT WORK WITH THE SB900 DIRECTLY. A SUITABLE PRINTER WITH THE PROPER CABLE IS AVAILABLE FROM THE STEINLITE CORPORATION. IT IS NOT NECESSARY TO UNDERSTAND ALL THE TECHNICAL DETAILS OF THE SERIAL PORT TO USE THIS PRINTER, BECAUSE EVERYTHING IS ALREADY SET UP CORRECTLY. ALL THAT IS NEEDED TO USE THIS PRINTER IS TO CONNECT THE PRINTER USING THE SUPPLIED CABLE, AND TO PLUG IN THE PRINTER'S POWER TRANSFORMER. WHEN USING THIS PRINTER, THE PRINTER SHOULD BE TURNED OFF **BEFORE** THE SB900, OTHERWISE THE PRINTER WILL START FEEDING PAPER UNTIL IT IS SHUT OFF.

WHEN THE SB900 IS CONNECTED TO A COMPUTER IT IS POSSIBLE FOR THE COMPUTER TO SEND KEYSTROKES TO THE SB900 AS IF THEY WERE ENTERED ON THE SB900'S KEYPAD. THE DIGITS 0-9 ARE USED TO REPRESENT THE KEYS 0-9 AND THE LETTERS 'A' THROUGH 'F' ARE USED FOR THE REMAINING KEYS AS LISTED BELOW.

A IS THE **'CANCEL'** KEY
B IS THE **'GO'** KEY
C IS THE **'PRINT'** KEY
D IS THE **'MODE'** KEY
E IS THE **'PREV'** KEY
F IS THE **'NEXT'** KEY

THE FOLLOWING IS A DESCRIPTION OF THE SIGNALS ON THE PRINTER CONNECTOR. ALL PINS OTHER THAN THOSE LISTED ARE UNCONNECTED. IN PARTICULAR, PIN 1 IS NOT A 'PROTECTIVE GROUND', BUT IS OPEN. PIN 7, THE SIGNAL GROUND IS CONNECTED TO THE CABINET, AS WELL AS THE ELECTRONICS. ALL THE SIGNAL LEVELS ARE NOMINALLY THOSE OF THE RS-232 STANDARD. THE ACTUAL LEVEL IS BETWEEN ±9v AND ±10v.

PIN 2: RXD: AN INPUT TO THE SB900. ACCEPTS DATA FROM OTHER DEVICES, SUCH AS A COMPUTER.

PIN 3: TXD: AN OUTPUT FROM THE SB900. THIS IS THE SERIAL DATA OUTPUT THAT SHOULD BE HOOKED TO THE INPUT OF THE OTHER DEVICE (e.g. PRINTER OR COMPUTER).

PIN 6: DTR: AN OUTPUT INDICATING THAT THE SB900 IS READY TO RECEIVE DATA ON PIN 2. WHEN THIS PIN DROPS LOW (A NEGATIVE VOLTAGE) IT INDICATES THAT THE SB900'S INPUT BUFFER IS FULL AND NO FURTHER CHARACTERS SHOULD BE SENT TO THE SB900 UNTIL THE LINE RETURNS HIGH (A POSITIVE VOLTAGE).

PIN 7: GND: THIS IS THE SIGNAL GROUND AND IS ALSO CONNECTED TO THE CABINET AND TO THE GROUND PRONG ON THE POWER CORD. CARE SHOULD BE TAKEN THAT THE GROUND OF THE OTHER PIECE OF EQUIPMENT IS NOT AT SIGNIFICANTLY DIFFERENT LEVEL, TO PREVENT EXCESSIVE CURRENT IN THE GROUNDING SYSTEM.

PIN 20: DSR: THIS IS AN INPUT TO THE SB900 WHICH INDICATES TO THE SB900 THAT THE DEVICE ON THE OTHER END IS READY TO RECEIVE A CHARACTER. IF THE LINE IS PULLED LOW, THE SB900 WILL NOT SEND MORE CHARACTERS UNTIL THE LINE RETURNS HIGH. IF THIS IS LEFT UNCONNECTED, THE SB900 ASSUMES THE OTHER DEVICE IS ALWAYS READY FOR CHARACTERS. SINCE THE SB900 MUST FINISH PRINTING BEFORE IT CONTINUES IN ITS PROGRAM A DEVICE THAT ASSERTS THAT IT IS NOT READY CONTINUOUSLY WILL 'HANG' THE MACHINE UP. IF THIS IS SUSPECTED, DISCONNECTING THE PRINTER SHOULD REMEDY THE PROBLEM.

THE SERIAL PORT ALSO RESPONDS TO CONTROL-Q AND CONTROL-S (OFTEN REFERRED TO AS XON AND XOFF). IF A CONTROL-S IS RECEIVED, THE SB900 WILL SUSPEND PRINTING UNTIL A CONTROL-Q IS RECEIVED. THIS HAS THE SAME POTENTIAL AS THE DSR SIGNAL, TO 'HANG' THE SYSTEM IF NO CONTROL-Q IS EVER RECEIVED, ONLY IN THIS CASE, DISCONNECTING THE LINE WON'T HELP. A CONTROL-Q MUST BE RECEIVED, OR THE SB900 MUST BE TURNED OFF THEN ON. IN EITHER CASE, A PROPERLY FUNCTIONING DEVICE AT THE OTHER END SHOULDN'T BE A PROBLEM. THE SB900 WILL ALSO SEND A CONTROL-S IF THE DTR SIGNAL IS IGNORED AND SUFFICIENT ADDITIONAL CHARACTERS ARE RECEIVED. IT WILL THEN SEND A CONTROL-Q WHEN IT IS READY FOR MORE.

IF YOUR SB900 IS NOT OPERATING PROPERLY...

THE SB900 IS A COMPUTER DEVICE - SOME PROBLEMS YOU MAY EXPERIENCE CAN BE SOLVED SIMPLY BY TURNING THE UNIT **OFF** AND THEN **ON** AGAIN. IF THE PROBLEM PERSISTS OR CONSTANTLY REOCCURS, FACTORY SERVICE MAY BE NEEDED. ENSURE VOLTAGE SELECTOR SWITCH IS IN CORRECT POSITION.

MAINTENANCE

IF THE SB900 DOES NOT TURN ON, FIRST CHECK TO MAKE SURE THAT THE UNIT IS PLUGGED IN TO POWER.

SECONDLY CHECK THE FUSE. SHOULD YOU NEED TO CHANGE THE FUSE:

1. UNPLUG POWER CORD FROM UNIT.
2. USING A SMALL SCREWDRIVER, PRY OFF FUSE PANEL LOCATED NEXT TO THE POWER CORD.
3. REPLACE THE FUSE WITH A **¼AMP 3AG FAST-ACTING FUSE.**
4. SNAP FUSE PANEL BACK INTO PLACE.

NO OTHER MAINTENANCE SHOULD BE DONE BY THE USER. IF YOU HAVE ANY MAINTENANCE QUESTIONS CONTACT THE STEINLITE CORPORATION.

WARRANTY

THE STEINLITE CORPORATION, THE MANUFACTURER, WARRANTS THE PRODUCTS TO BE FREE FROM DEFECTS CAUSED BY FAULTY MATERIALS OR WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SHIPMENT. THE LIABILITY UNDER THIS WARRANTY IS LIMITED TO REPAIRING OR REPLACING (F.O.B. FACTORY) ANY PRODUCTS WHICH ARE DEFECTIVE.

THE WARRANTY DOES NOT EXTEND TO ANY DEFECT CAUSED BY FIRE, FLOOD, DISASTERS, DISORDERS, NEGLIGENCE, MISUSE, ACCIDENT, OR **UNAUTHORIZED REPAIR** OR ALTERATION AFTER THE PRODUCTS LEAVE THE FACTORY.

SINCE MANY FACTORS BEYOND THE CONTROL OF THE MANUFACTURER AFFECT THE ACCURACY OF MOISTURE TESTS, THE STEINLITE CORPORATION WILL NOT BE RESPONSIBILE FOR ANY LOSS DUE TO TESTING, STORAGE, PROCESSING OR CONDITIONING ANY GRAIN OR COMMODITY.

LABORATORY FACILITIES AVAILABLE--

THE STEINLITE CORPORATION MAINTAINS A TESTING LABORATORY FOR THE MOISTURE ANALYSIS OF GRAIN AND FOOD PRODUCTS. THE SAME ANALYTICAL PROCEDURES AND OVEN METHODS SPECIFIED IN THE SERVICE AND REGULATORY ANNOUNCEMENTS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE ARE EMPLOYED IN OUR LABORATORY. THESE BASIC METHODS FOR MOISTURE DETERMINATION ARE USED IN THE CALIBRATION OF OUR GRAIN MOISTURE TESTERS.

WHENEVER YOU REQUIRE INFORMATION ON THE MOISTURE TESTING OF GRAIN, PLEASE ADVISE US. WE SHALL BE PLEASED TO BE OF SERVICE TO YOU.

WHAT YOU SHOULD KNOW ABOUT MOISTURE TESTERS

THERE ARE TWO CURRENT METHODS OF TESTING MOISTURE IN GRAIN, THE PRIMARY AND THE SECONDARY METHODS. THE PRIMARY METHOD CONSISTS OF A VERY EXACTING PROCEDURE USING THE AIR OVEN. THIS PROCEDURE IS EXTREMELY SLOW AND OBVIOUSLY WOULD NOT BE SUITABLE FOR ELEVATOR PURPOSES. FOR THAT REASON, THE SECONDARY METHODS WERE DEVELOPED WHEREIN THE ELECTRICAL PROPERTIES OF GRAIN CAN BE MEASURED QUICKLY AND CONVERTED INTO A MOISTURE READING FOR THE GRAIN TESTED.

ALTHOUGH RESEARCH AND TECHNOLOGICAL IMPROVEMENTS HAVE BEEN MADE, IT REMAINS VIRTUALLY IMPOSSIBLE TO TEST GRAIN WITHOUT SOME VARIANCE. SOME OF THE FACTORS THAT ARE INVOLVED ARE DISCUSSED BELOW.

THE STANDARD REFERENCE METHOD

THE STANDARD REFERENCE METHOD FOR CORN USED IN THE CALIBRATION OF MOISTURE METERS IS THE 72 HOUR 103°C AIR OVEN METHOD. THE SAMPLE IS UNGROUND.
WE NOT ONLY HAVE DIFFERENT GRAINS SUCH AS WHEAT, BARLEY, OATS, MILO, CORN, SOYBEANS, RICE AND OTHERS, BUT HAVE NUMEROUS VARIETIES WITHIN EACH TYPE OF GRAIN.

EACH GRAIN PRODUCES ITS OWN UNIQUE PROBLEM TO THE MOISTURE TESTING INDUSTRY AND AS NEW STRAINS, HYBRIDS AND VARIETIES ARE DEVELOPED, THE ELECTRICAL PROPERTIES OF THOSE GRAINS MAY CHANGE SLIGHTLY NECESSITATING ADJUSTMENTS FROM TIME TO TIME IN THE CALIBRATION OF THE VARIOUS MOISTURE TESTERS. UNFORTUNATELY THE GRAIN CANNOT BE TESTED UNTIL AFTER THE CROP IS GROWN AND THE CALIBRATIONS CANNOT BE CHANGED UNTIL AFTER SUFFICIENT SAMPLES ARE TESTED TO DETERMINE THE CHANGE IN THE ELECTRICAL PROPERTIES OF THE GRAIN.

THE SIZE OF THE KERNEL ALSO EFFECTS THE ABILITY TO TEST. CORN IS THE MOST DIFFICULT GRAIN TO TEST BECAUSE OF THE SIZE OF THE KERNEL AND THE IRREGULAR SHAPE. WHEN ONE NOTES THE SIZE OF THE CORN KERNEL, THE IRREGULAR SHAPE AND THE FACT THAT THERE ARE NOW SOME 400 DIFFERENT VARIETIES MATURING FROM 90 TO 150 DAYS ONE CAN SEE THAT THE CONTINUALLY CHANGING ELECTRICAL PROPERTIES ADD TO THE PROBLEM OF ACCURACY IN MEASURING THE MOISTURE CONTENT.

MOISTURE RANGE AND TEMPERATURE LIMITS

THE MOISTURE AND TEMPERATURE HAVE BEEN FOUND TO SUBSTANTIALLY AFFECT THE ACCURACY OF MEASUREMENT OF MOISTURE CONTENT IN GRAIN. GREATER PROBLEMS ARE CREATED WITH GRAINS SUCH AS SORGHUM AND CORN THAT COME IN THROUGH THE FALL AND WINTER MONTHS WHERE ICE, SNOW AND FREEZING CAN AFFECT THE RESULTS.

OTHER FACTS

LOW GRADE, MOLDY, SOFT OR LIGHT TEST WEIGHT GRAIN FREQUENTLY CREATES A TESTING PROBLEM. MOISTURE METERS ARE CALIBRATED WITH QUALITY KERNELS OR GRAIN AND ANY ATTEMPT TO MEASURE THE ELECTRICAL PROPERTIES IN GRAIN WHEN IT IS CRUSHED, BROKEN OR CONTAINS A LARGE AMOUNT OF FOREIGN MATERIAL QUITE OBVIOUSLY WILL AFFECT THE TEST RESULTS. DIFFERENT PARTS OF THE COUNTRY, DIFFERENT GROWING METHODS AND SOILS ALL MUST BE CONSIDERED FOR AVERAGES IN ATTEMPTING TO CALIBRATE A MOISTURE METER FOR USE THROUGHOUT THE COUNTRY.

THE HUMAN FACTOR

IN THE OPERATION OF EACH MOISTURE METER, CERTAIN MECHANICAL OPERATIONS MUST BE PERFORMED BY HUMANS. A REPRESENTATIVE SAMPLE OF THE LOAD MUST BE TAKEN, THE MOISTURE RANGE AND TEMPERATURE MUST BE OBSERVED. THE WEIGHING OF THE SAMPLE MUST BE ACCURATE. THE SCALES MUST BE CHECKED PERIODICALLY. THERE IS A TENDENCY FOR HUMANS TO BECOME CARELESS WHEN THE LINES ARE LONG AND THERE IS PRESSURE TO MOVE FASTER BY THE ELEVATOR OPERATOR AND BY THE FARMER WHO IS UNDER PRESSURE TO GET BACK TO THE FIELD FOR THE NEXT LOAD.

CONCLUSION

THE FOREGOING ARE SOME OF THE PROBLEMS CONNECTED WITH THE MOISTURE TESTING INDUSTRY AND BY THE MANUFACTURER OF MOST EVERY TYPE OF MOISTURE METER ON THE MARKET TODAY. THE STEINLITE CORPORATION RUNS A CONTINUOUS TESTING AND RESEARCH FACILITY IN ORDER TO PROVIDE THE GRAIN INDUSTRY WITH WHAT WE FEEL IS THE BEST MOISTURE METER AVAILABLE. YOU CAN ASSIST US IN MAINTAINING A HIGH STANDARD OF EXCELLENCE BY SENDING PERIODIC SAMPLES OF GRAIN TO OUR TESTING FACILITY IN ATCHISON, KANSAS.

THE STEINLITE CORPORATION

COMMODITY IDENTIFICATION NUMBERS AND TESTING WEIGHTS MOISTURE RANGES AND TEMPERATURE LIMITS

I.D. CODE #	ABBREVIATION USED	COMPLETE NAME	TESTING WEIGHT/grams	MOISTURE RANGE	TEMPERATURE LIMIT
100	CORN #4	Corn #4	250	10-35%	50-90°F
101	SOY 85	Soybean 85	250	9-18%	65-85°F
102	HRWW #3	Hard Red Winter Wheat #3	250	9-18%	50-90°F
103	HRSW #4	Hard Red Spring Wheat #4	250	9-18%	50-90°F
104	SRWW	Soft Red Winter Wheat or Soft White Wheat	250	9-18%	50-90°F
105	DURUM WHEAT	Durum Wheat	250	9-18%	50-90°F
106	OATS #3 200G	Oats #3	200	9-18%	50-90°F
107	MILO #4	Milo #4	250	9-22%	50-85°F
108	BARLEY	Barley	250	9-18%	50-90°F
109	W. BARLEY	Western Barley	250	9-18%	60-80°F
110	SG R RICE	Short Grain Rough Rice	250	9-30%	50-90°F
111	MG R RICE	Medium Grain Rough Rice	250	9-30%	50-90°F
112	LG R RICE #3	Long Grain Rough Rice #3	250	9-27%	50-90°F
113	RYE	Rye	250	9-18%	50-90°F
114	YEL POPCN #2	Yellow Popcorn #2	250	12-18%	60-90°F
116	ED SNFL 150G	Edible Sunflower	150	10-18%	65-85°F
117	OIL SFL 150G	Oil Sunflower	150	10-18%	65-85°F
118	SAFFLWR 225G	Safflower	225	6-16%	65-85°F
119	FLAXSEED	Flaxseed	250	7-15%	65-85°F
120	LENTILS	Lentils	250	9-18%	50-90°F
121	RAPESD 200G	Rapeseed	200	5-12%	70-90°F

NOTE: SOME STATES SPECIFY NUMBERED CALIBRATIONS (e.g. CORN #4).

THE MOISTURE AND TEMPERATURE LIMITATIONS SHOWN INDICATE THE RANGES WHERE YOU OBTAIN THE BEST RESULTS. TESTS OUTSIDE THESE RANGES HAVE A CERTAIN DEGREE OF INACCURACY. GRAINS TESTED OUTSIDE THESE TEMPERATURE LIMITS, HOWEVER, WILL GIVE SIMILAR TEMPERATURE CORRECTED READINGS TO THAT OF OTHER MOISTURE TESTERS THAT MEASURE THE ELECTRICAL PROPERTIES OF GRAINS.