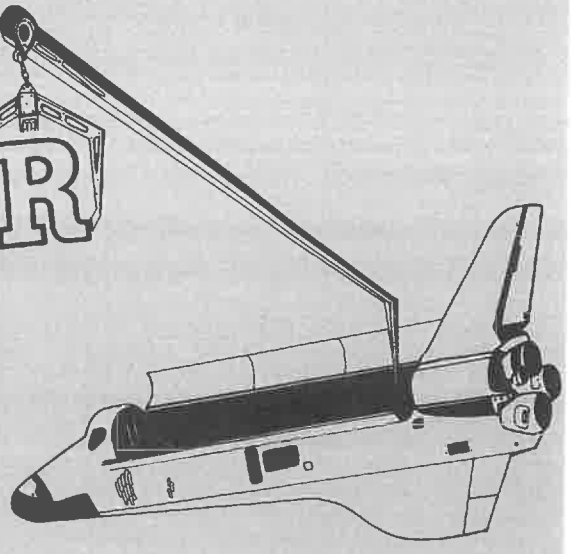
CHALLENGE™ R



"WHEN SKILL COUNTS"

WEDGES/LEDGES OF CALIFORNIA, INC.

123 International Boardwalk
Redondo Beach, California 90277
(213) 374-9982 (213) 379-8510

CHALLENGER™ OPERATION AND MAINTAINANCE

1) UPPER TRACK UNIT: The panagraph system used in the CHALLENGER movement should be clean and lubricated at least weekly. There are two stainless steel rods which guide the horizontal movement and these should be wiped clean and lubricated with a light grease.* Dirty or gummy tracks will result in the movement being slow or stopped.

2) CLUTCHES: All motors in the CHALLENGER are clutched to prevent stalling and overheating. These clutches are tension/cork type and need little maintenance. Care should be taken not to oil or lubricate the clutch surface. Also, pulleys must <u>not</u> be permanently attached to the clutch shaft or the tension adjusted so tightly that the pulley will stop the motor rotation.

A) UPPER TRACK CLUTCHES: These come adjusted at the factory so that the upper carriage will move to all locations within the game when the upper track guides are clean and lubricated. Should the upper track unit stall, clean the guides as explained in #1. If there still is a problem, check the tightness of the drive cables. These cables should not slip on the clutch due to looseness which may develop with age and use. When adjusting the cables tighten only until the clutch slips. Over tightening will cause excessive stretch and wear to the cables and strain on the motor bearings. If the clutch slips and the upper tracks are clean and lubricated and stalling still occurs the clutch is too loose. Tighten the clutch by turning the adjusting nut clockwise one/half turn at a time, while checking movement. When the upper movement is free, stop. Overtightning will break the mechanism.

* WEDGES/LEDGES factory uses a white lubricating grease.

B) CHAIN CLUTCH: The CHALLENGER chain wraps around a metal pulley which is also clutch driven. The tension of this clutch is pre-set at the factory so that the grasping mechanism will lift 8 ounces. During the first weeks there may be a seating of the clutch and the claw might not rise after the descent quickly enough. If this happens, tighten the adjusting nut one/half turn and test the upper movement of the claw with an item in it's grasp. When the clutch will cause flattening of the chain and excessive wear of the chain roller guide.

3) CHAIN: The CHALLENGER chain is stainless steel and should last indefinatly (over 250,000 cycles) under normal use. Maintenance should be limited to cleaning excess dirt with a napkin and lubricating with oil or a light grease.

4) CHAIN ROLLER: The chain roller guide is aluminum and will need replacing every 20 to 30 thousand plays. This guide is designed to wear so that the chain will not. Replacement guides are available and care should be taken to replace the guide before the chain wears through the guide and the roller screw.

5) GRASPING MECHANISM: This assembly is designed to operate under all conditions and needs little maintenance. Weekly checks to see that the movement is free and unobstructed are necessary. The plunger should be clean and not-lubricated. Oil or grease on the plunger will attract dirt and impare the free movement of the mechanism.

Should you need further information or technical advice please call 213-374-9982 and we will be glad to offer assistance.

THANK YOU FOR OPERATING CHALLENGER

WEDGES/LEDGES OF CALIFORNIA INC.

CHALLENGER T.M.

GENERAL DESCRIPTION

The CHALLENGER crane is a game of skill in which the crane mechanism is positioned over the playfield by two electric motors. A third motor provides the UP and DOWN travel of the CLAW mechanism, which is itself operated by an electric solenoid. Prizes may be captured in the claw mechanism, raised and transported to the delivery chute. These three motors and one solenoid are driven by an electronic control system which is constructed on a single printed circuit board contained within the game cabinet.

The control system responds to input signals from the player, and provides an automatic and consistent play sequence. A melodic "sound track" is also generated by the electronic system which reflects the moment-by-moment status of the game sequence.

OPERATIONAL FEATURES

When power is applied to the game, a "Power-Up-Reset" sequence is initiated. This sequence performs a "self test" of the system and positions the crane to the left-most forward-most corner of the playfield. This corner the "home" position, is the normal starting position for subsequent play.

A play sequence is initiated by the player inserting a coin (or coins) into the coin mechanism. Either one or two coins may be required. This option may be selected by the owner/operator by means of a "jumper wire" on the electronic board.

When properly "coined", the game will respond with a characteristic sound, and the crane will "jump" a short distance to the right and to the rear. This sound and motion is designed to alert the player that the "joystick enabled" period of game play has begun.

During the "joystick enabled" period, the player may direct the positioning of the crane mechanism by means of an eight-way "joystick" control. The joystick commands the crane to travel in a horizontal two-dimensional X/Y plane along any one of eight vectors, ie, Left, Right, Forward, Back, or on any one of the four diagonals.

The speed of travel may be selected by the player between two pre-set rates: The normal (fast) rate is automatically selected unless the "SLOW" pushbutton is pressed, which slows the rate of travel significantly.
The "sound track" provides the player with audio "feedback" as to the time remaining in the joystick-enabled period. The melody increases in both pitch and tempo, culminating in a high-pitched tone which signals the end of the joystick-enabled period.

After a brief pause, the crane begins its descent to the floor of the playfield, accompanied by a melody line descending in pitch. During this descent, the player no longer has control over the X/Y positioning of the crane, but may control the rate of descent by pressing the STOP button. This will arrest the downward motion of the crane while the button is pressed, resuming downward travel when the button is released.

At a time deemed appropriate by the player, the CLAW button may be pressed, thereby engaging the "claw" in a clamping action. The objective is the gripping a prize on the playfield floor for subsequent delivery to the player. The CLAW button may be pressed concurrently with the STOP button.

Although the player may excercise control over these events during the descent period, it should be noted that the maximum period of time available for the crane descent and gripping of a prize is limited. At the terminus of this period, the claw will automatically be engaged if the player has not elected to do so previously. Moreover, activating the STOP button during the descent does not increase the maximum time available, and the descent period may terminate even while the STOP button is being pressed. This is indicated to the player by the fact that the melodic descent of the sound track does not vary even though the STOP button may be depressed.

(Note that in some versions of the product the STOP button may be combined with the SLOW button described previously. Both functions are activated by a single control line to the electronic board, with the resultant action being a function of the phase-of-play in which the button is used. Where two buttons are supplied for player convenience, they are wired "in parallel" and either button will produce both results depending upon when they are pressed.)

The gripping action of the claw is immediately announced by a characteristic sound, irrespective of whether it was initiated automatically or by the player's use of the CLAW button.

Immediately thereafter, the crane begins its ascent with the claw closed, accompanied now by an ascending melody line.

At the limit of upward travel, the crane pauses briefly, then begins travel in a Left, Forward direction to the home position. The claw is maintained in the closed condition.

The game automatically concludes with the opening of the claw mechanism while the crane is in the "home" position which, if the player has been successful, results in the delivery of the captured prize. Distinctive sound patterns are provided during travel to the "home" position and the with the opening of the claw.

The game may be "coined" at any step during the sequence with the following results: If the game is coined during the "joystick active" period, the game will begin anew from the current position of the crane, beginning with the short "Jump" motion in a Right, Rear direction. If the game is coined during either the descent period or the ascent period, the game will begin anew (with the jump motion and an open claw) immediately upon reaching the upper limit of travel, irrespective of the player's success in gripping a prize. If the game is coined during subsequent travel to the home position, the claw will be immediately opened (releasing any prize which may have been captured) and the game will begin anew (with the jump motion) at the current position of the crane. In all cases the sound characteristic of coining the game will be presented.

THEORY OF OPERATION

The crane is positioned in three dimensions by three motors of the "DC Permanent Magnet" type. Reference to these motors will be made as follows: The "X" motor provides motion in a Left/Right direction (viewing the game cabinet from the front); the "Y" motor moves the mechanism Forward/Back; and the "Z" motor transports the CLAW mechanism UP and DOWN. These motors are are driven by three similar circuits on the electronic board. Each of these three circuits includes two SPST relays (K1-K6). One pair of relays controls each motor. When a relay is activated, the positive power supply voltage is connected (via the NO terminal of the relay) to one terminal of the motor, while the opposite terminal remains connected to the GROUND side of the power supply through the NC terminal of the paired relay. The direction of travel of the associated motor may be reversed by reversing the polarity of the DC voltage applied to the motor, and this is accomplished by activating the opposite relay in a given pair, while its mate remains in the de-activated condition. In the case of the X and Y motors (but not the "Z" motor), a variable voltage source (Q5) which is used to adjust the speed at which the motor will operate.

Each motor is therefore controlled by two relays, one for each direction. The coils of these relays are connected to the +12 VDC power supply, and are activated by the 7416 open-collector inverter (U9).

The source of the control logic signals which are the inputs to the 7416 open collector inverter are six of the eight outputs from a 2716 EPROM memory chip, U4. The signals which operate the X and Y motors are applied to the 7416 inputs through 330 ohm resistors. This allows additional control signals to be "gated" into the 7416 from the player-controlled joystick via D9-D12.

The joystick consists of four switches wired with a common "enable" signal. This enable signal is provided by one of the two remaining EPROM outputs, O6, via isolating resistor R24. The current available to the joystick in the enabled condition is by pull-up resistor R28.

Input current to the 7416 inverter controlling the Z motor is removed when the player presses the STOP button. This shorts the RUN signal to ground through a signal diode, turning the Z motor OFF. Pressing the same button also grounds the SLOW speed resistor which is in the ground leg of the voltage divider which provides the input to an emitter-follower transistor (Q5). Q5 in turn provides the drive voltage to the X and Y motor windings via the NO relay contacts. The effect of adding this resistance to the voltage divider is to lower the drive voltage by a preset amount and hence decrease the speed of the motor.

The EPROM is programmed to output the necessary control signals to produce the desired sequence of operation. It is addressed by an eight bit "program counter" (4520,U5) which "steps through" the program in response to variable rate clock pulses.

The clock pulses are generated by two interconnected Schmitt trigger inverters contained in U3. The pulse rate is a function of the selection of which timing resistor is selected by U7 (4051) "one of eight" analog switch. This selection is made on the basis of data pre-programmed into the EPROM and results in a widely variable period in which the program counter (and hence the EPROM output) remains in a given state. The resistor selection data is stored into U6 (4508) 8 bit latch on each clock pulse by the following means: In addition to clocking the program counter, the clock pulse is connected to address line A10 of the EPROM. Therefore, when it is in a HIGH state, it causes the EPROM to briefly output data from a "page" in "high memory" where the appropriate timing information has been programmed. On the HI to LO transition of the clock pulse, the 3 bit binary number representing the appropriate timing resistor are stored in the 4508 latch, the output of which drives the "SELECT" inputs of the 4051 "one-of-eight" analog switch.

While the relay control signals discussed above are programmed into the "low memory" pages, the "high memory" pages contain data on the timing requirements and data selecting the tone output for the "sound track". On the falling edge of the clock pulse, this information is stored into the 4508 latch as described above, and the program counter is advanced. In addition to the timing data, the 4508 latch provides a "1,2,4,8" output to a weighted resistor network (R18-R21). This in turn provides a control voltage to the Voltage Controlled Oscillator (VCO) contained in U8 (4046) "Phase Locked Loop" chip. This tone output is enabled by an active-low output from the EPROM (O3) to provide tone output when it is desired. This tone output is amplified and level-controlled by two transistors (Q4, Q9), then sent off of the board to a speaker.

The game is initiated by briefly grounding the COIN input. This causes the output at U3-8 (a "de-bouncing" inverter) to clock 4013 D type flip flop U2-1. Since the "D" input is held LO, the flip flop is caused to reset, which in turn resets the program counter. Flip flop U2-2 is held in a reset condition (thereby holding the "D" input of U2-1 LO) by a removable jumper wire, causing U2-1 to be clocked by a single "coin" signal. If this jumper is removed, two coins are required to initiate play. In this mode, U2-2 is normally in the "set" condition, and is reset by the first coin signal. The first coin signal is, however, "ignored" by U2-1 due to the HI logic level on its "D" input. After U2-2 has been reset by the first coin, U2-1 responds to the second coin signal because the "D" input is now at the required LO level.

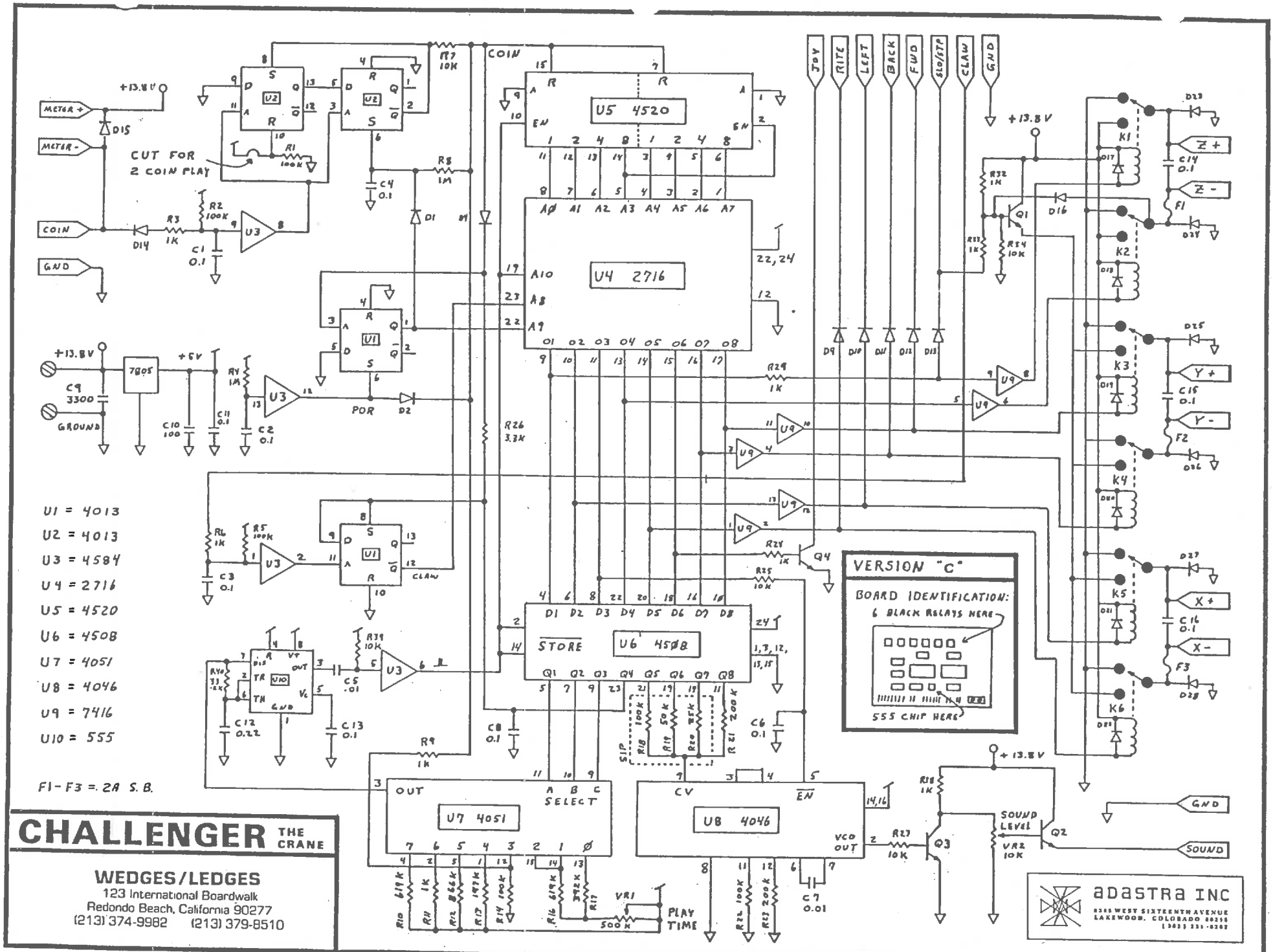
The input to the de-bouncing inverter discussed immediately above is connected to the COIN connector through a 1K resistor and an isolation diode. This permits the operation of a 12 volt coin counter (meter) which may be plugged on to the furnished connector. When the coin switch is closed, the "high side" of the coin switch input connector is grounded through the coin switch. This in turn grounds the "low side" of the "counter (meter) connector. The "high side" of the meter connector is connected on the PC board to the +12 volt power supply, so a momentary ground on the "low side" causes the counter to advance each time the coin switch is activated. A back-biased signal diode is provided across the meter output to snub back-EMF currents from the meter coil.

Pressing the CLAW button causes flip-flop U1-2 to change its output state, due to the clocking signal generated at U3-2. This in turn causes the program counter to address a different page in EPROM memory by presenting a HI logic level at address line A8 of the EPROM. This page has program data appropriate to the modified play sequence which is required in response to pressing this button. Specifically, the steps remaining in the normal descent sequence are quickly "skipped over" due to the selection of a low value resistor by the 4051, resulting in a rapid clock rate. When the ascent period is reached, the clock rate returns to "normal".

A "power up" initializing sequence is built into the system to insure that the crane mechanism is operating properly, and to position it appropriately for the beginning of play. Flip-flop U1-1 is briefly "set" during the initial "Power Up Reset" period due to the momentary HI level from U3-12. This initializes the "coin" flip flops, and also causes the program counter to address a page in memory appropriate to the "power up" sequence by presenting a HI logic level on address line A9 of the EPROM.

When a HI level from EPROM output O4 is latched into the U6 latch, the HI output at U6-23 initializes all flip flops and the U5 program counter for normal play. This output is also used to inhibit a restart of the game during the descent and ascent by latching LO and disabling the U5 reset signal through diode D4. This active-low inhibit signal is removed at the end of the ascent period. Therefore, if the came has been appropriately coined during either descent or ascent, program counter U5 will be immediately reset.

The logic circuitry is powered from the output of a 7805 5 Volt regulator. The regulator is in turn powered by an external 12-15 VDC voltage source, which also provides motor drive, relay coil voltage, and the high level sound output.



CHALLENGER THE CRANE

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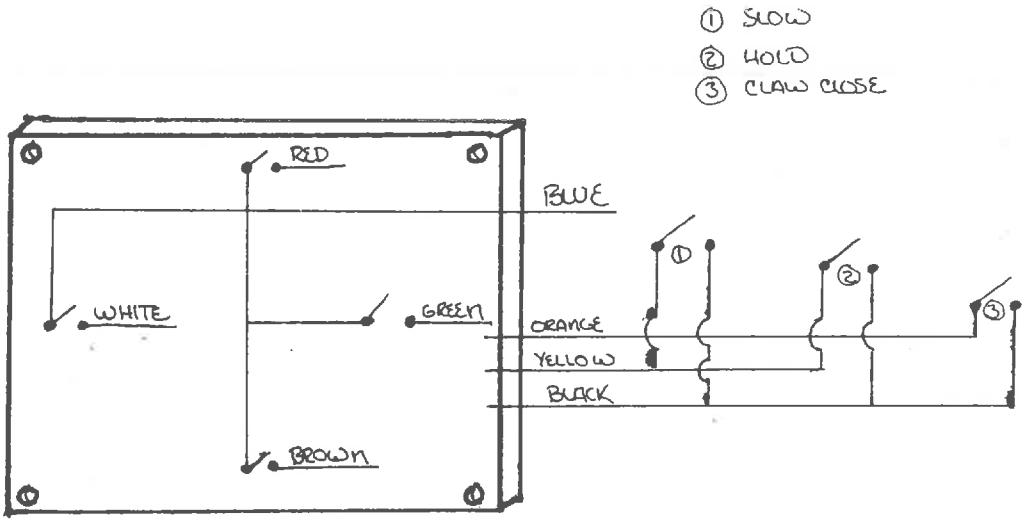
TO ALL CHALLENGER DISTRIBUTORS AND OPERATORS:

It is very important that the time allowed for the positioning of the grasping mechanism is clearly posted on the instruction panel. This time may be operator set from 5 to 11 seconds. The game is pre-set at the factory at 9 seconds. Enclosed are labels which can be used. Please determine the alloted time in seconds and post it on the Challenger instruction panel. It is also important that the size and weight of the prize be consistant with the posted standards, and that the claw be in proper adjustment and repair.

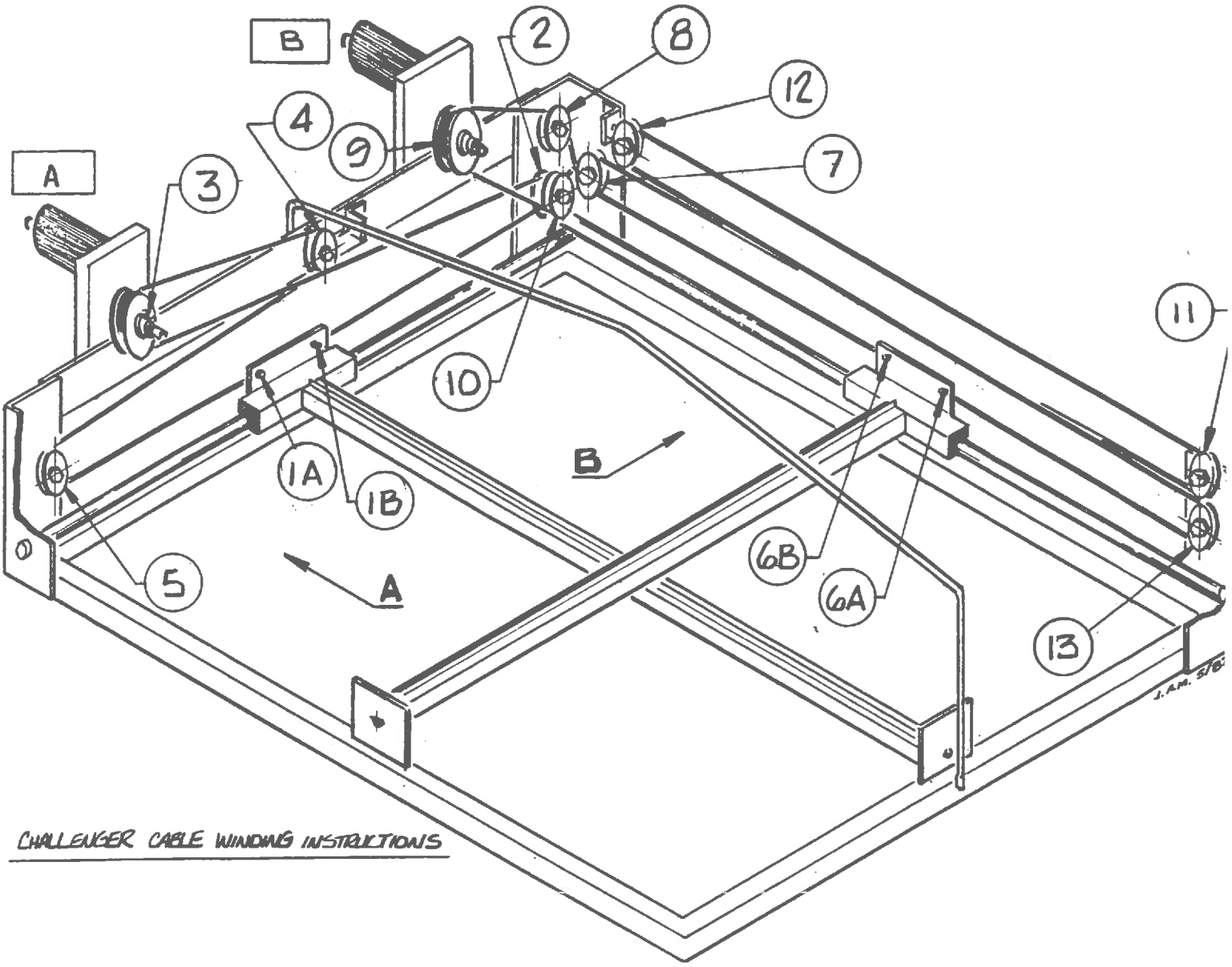
Replacement of the coiled cord to the claw unit should only be done witlh wire which will carry 2 amps @ 12 V.D.C. . Normal telephone cord does not handle the current load and will cause slowing of the claw motor and burning of the brushes.

Challenger claw descent is timed so that the mechanism will reach the bottom of the prize area. It is important that the prizes be the depth of the prize retainer/instruction panel.

JOYSTICK WIRING SCHEMATIC



CHALLENGER CALE WINDING INTRUCTIONS



"A" SIDE

A) (1A) TO UNDERSIDE OF (2)
B) (2) TO UNDERSIDE OF CLUTCH UNIT (3) AND WRAP THREE TIMES AROUND.
C) FROM TOP OF (3) TO TOP OF TENSION WHEEL (4)
D) FROM (4) TO TOP OF (5)
E) FROM (5) TO (1B) AND ATTACH

"B" SIDE

A) (6A) TO UNDERSIDE OF (7)
B) 90° TURN TO TOP OF (8)
C) FROM (8) TO TOP OF CLUTCH UNIT (9) AND WRAP THREE TIMES AROUND
D) FROM BOTTOM OF (9) TOUNDERSIDE OF (10)
E) 90° TURN TO TOP OF (7)
F) FROM TOP OF (7) TO BOTTOM OF (11)
G) FROM (11) TO TOP OF TENSION WHEEL (12)
H) FROM (12) TO TOP OF (13)
I) FROM BOTTOMOF (13) TO (6B) AND ATTACH

LIMITED WARRANTY

"WEDGES/LEDGES" and "CHALLENGER" are warranted by Wedges/Ledges of California, Inc., to the original user against defects in workmanship or materials under normal use for ninety days after the date of purchase. Any part which is determined to be defective in material or workmanship and returned, shipping costs prepaid, will be repaired or replaced at the sole discretion of Wedges/Ledges of California, Inc.. The warranty will be void if the unit is not installed properly.

WARRANTY DISCLAIMER. Wedges/Ledges of California, Inc., does not express nor imply a warranty that the games, "WEDGES/LEDGES", or "CHALLENGER" are legal to operate in any jurisdiction, or that these games will necessarily conform to any local ordinances.

Except as provided, no warranty or affirmation of fact, express or implied, other than as stated in "Limited Warranty" or "Warranty Disclaimer" above is made or authorized by Wedges/Ledges of California, Inc. The liability of Wedges/Ledges of California, Inc., in all events is limited to the purchase of the parts which are shown to be defective.

PROMPT DISPOSITION. Wedges/Ledges of California, Inc. will make a good faith effort for prompt correction or other adjustments with respect to any parts which prove to be defective within the warranty period. We request that when calling for service that you have the model number and serial number of the unit so that we may better solve your problem.

SHIPPING DAMAGE. If product is damaged in shipment, contact your carrier.

WEDGES/LEDGES OF CALIFORNIA, INC.
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TO ALL CHALLENGER ™ OWNERS AND OPERATORS:

THE ACCEPTANCE OF CHALLENGER AS A MERCHANDISER WHERE SKILL PREDOMINATES IS LARGELY DEPENDENT UPON THE SIZE AND WEIGHT* OF THE ITEM IN RELATION TO THE SIZE OF THE GRASPING MECHANISM.

CHALLENGER MERCHANDISERS COME STANDARD WITH SIX INCH FINGERS ON THE GRASPING MECHANISM AND IS DESIGNED TO EFFECTIVELY RETRIEVE ITEMS THREE & ONE/HALF TO SIX INCHES IN DIAMETER... (cost 50¢ to 90¢ / 1986)

REPLACEMENT FINGERS ARE AVAILABLE WHICH ARE FIVE INCHES IN LENGTH AND WILL EFFECTIVELY GRASP ITEMS TWO & ONE/HALF TO FOUR INCHES IN DIAMETER... (cost 40¢ to 75¢ / 1986)

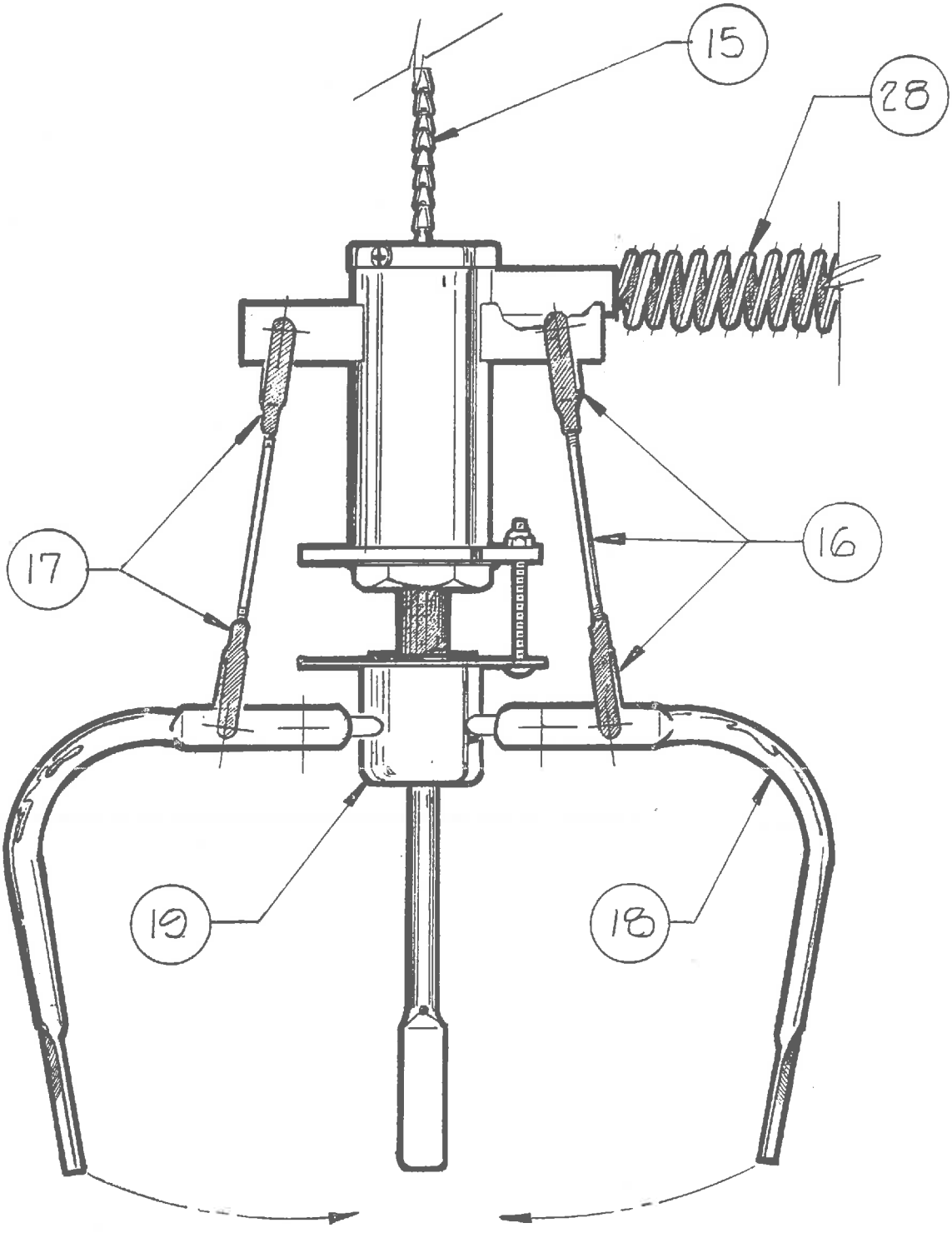
TO ACCENTUATE THE DIFFERENCE, A GRASPING MECHANISM WHICH WILL PICK UP A PILLOW WILL NOT EFFECTIVELY GRASP A BEAN BAG. YOU MUST USE THE CORRECT SIZED ITEM WITH THE APPROPRIATE GRASPING MECHANISM. ITEMS WHICH CANNOT BE RETRIEVED CONSTITUTE A DECEIT UPON THE PLAYER AND MAY NEGATE THE PREDOMINANCE OF SKILL.

PLACING THE APPROPRIATE ITEMS IN THE CHALLENGER MERCHANDISER IS THE RESPONSIBILITY OF THE OWNER/OPERATOR. PURCHASING A STANDARD ASSORTED PACKAGE CONTAINING DIFFERENT ITEMS IS FINE. HOWEVER, THE CONTENTS MUST BE CONSISTANT IN SIZE, WEIGHT AND COST. INCONSISTENCY WILL RESULT IN SKILLFUL PLAYERS PICKING THE SUITABLE MERCHANDISE AND LEAVING THE UNGRASPABLE ITEMS FOR THE UNSKILLED OR UNKNOWLEDGEABLE PARTICIPANT...

THE DISPLAY OF MERCHANDISE WHICH CANNOT BE RETRIEVED IS FRAUDULENT.

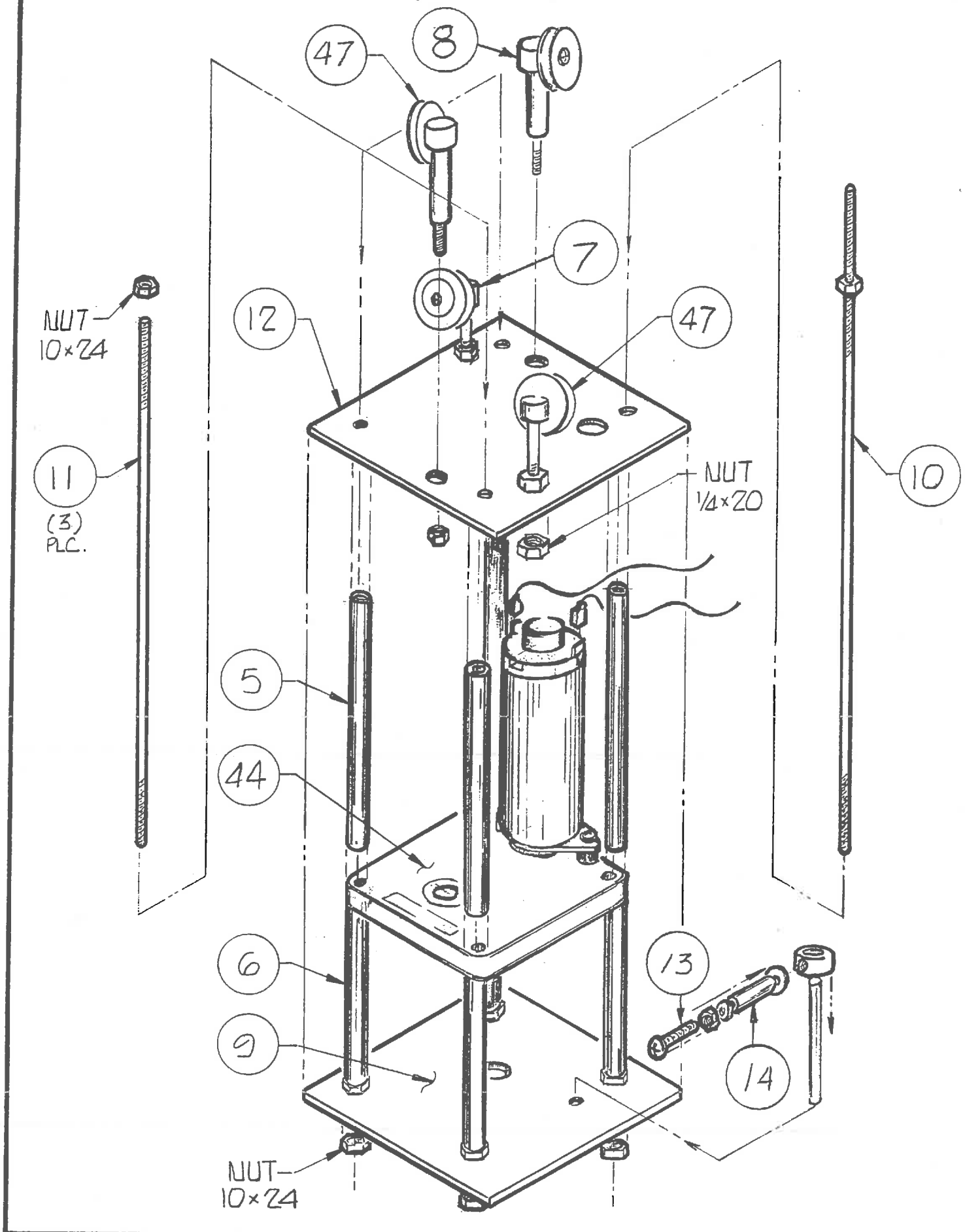
WEDGES / LEDGES OF CALIFORNIA, INC.

* maximum weight - 6 ounces.



20 CLAW UNIT
OPEN POSITION

CARRIAGE UNIT



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