



MIDWAY MFG. CO.

PHONE: AREA CODE 312 678-1350

3750 RIVER ROAD • SCHILLER PARK, ILLINOIS 60176

Midway's "BULL'S EYE" Dart Game

This game is operated only as a two-player game; one coin gives two player operation. It will accept up to nine coins for credit.

Bull's Eye is a game to test a player's reflex; the object of the game is to release a dart at the proper time to achieve the highest score in the dart board. Each player has his own release switch; he presses the switch to start the dart hand action and releases the switch to release the dart.

If the dart is released too soon, it will take the upper path, score 2, 4 or 6 in the upper portion of the dart board, and will state "Dart Released Too Soon" on the glass.

If the dart is released too late, it will take the lower path, score 2, 4 or 6 in the lower portion of the dart board and will state "Dart Released Too Late".

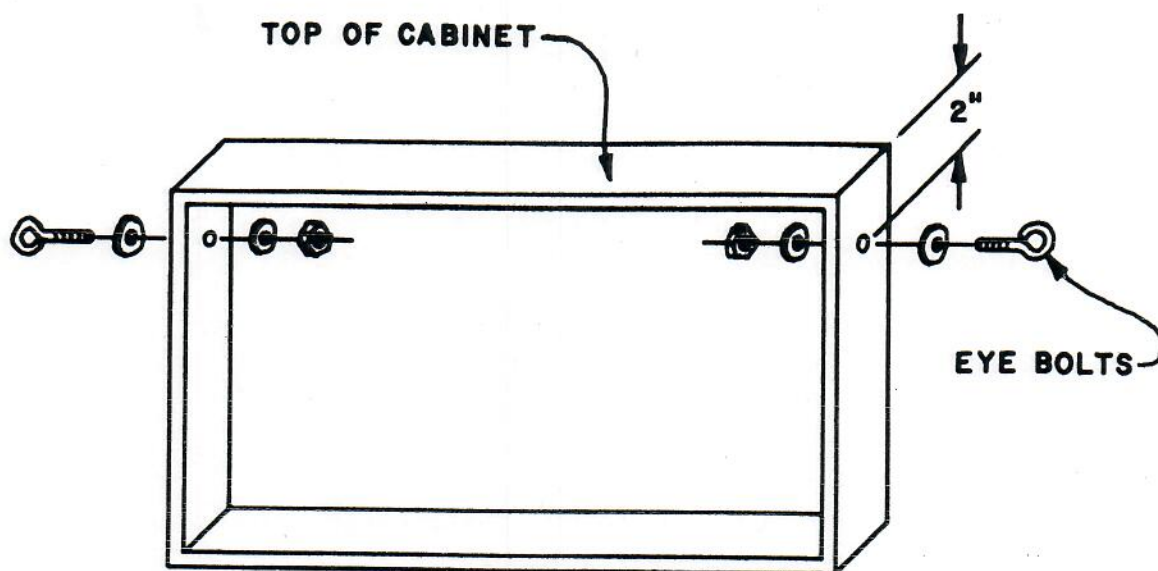
If the dart is released just right, it will take the center path and score either 8 or 10.

The players play alternately until a score of 50, 60, 70, 80 or 90 is reached by either player, which causes "Game Over". This amount of score is determined by a control jack located inside the dart score panel.

The game is available to be operated four different ways:

- #1 Operated as a wall mounted game with a wall mounted coin box with REMOTE control switch boxes.
- #2 Same as #1, except with CABLE connected control switches.
- #3 The dart score panel is mounted upon a floor pedestal which has its own coin mechanism. REMOTE control switch boxes are used.
- #4 Same as #3, except with CABLE connected control switches.

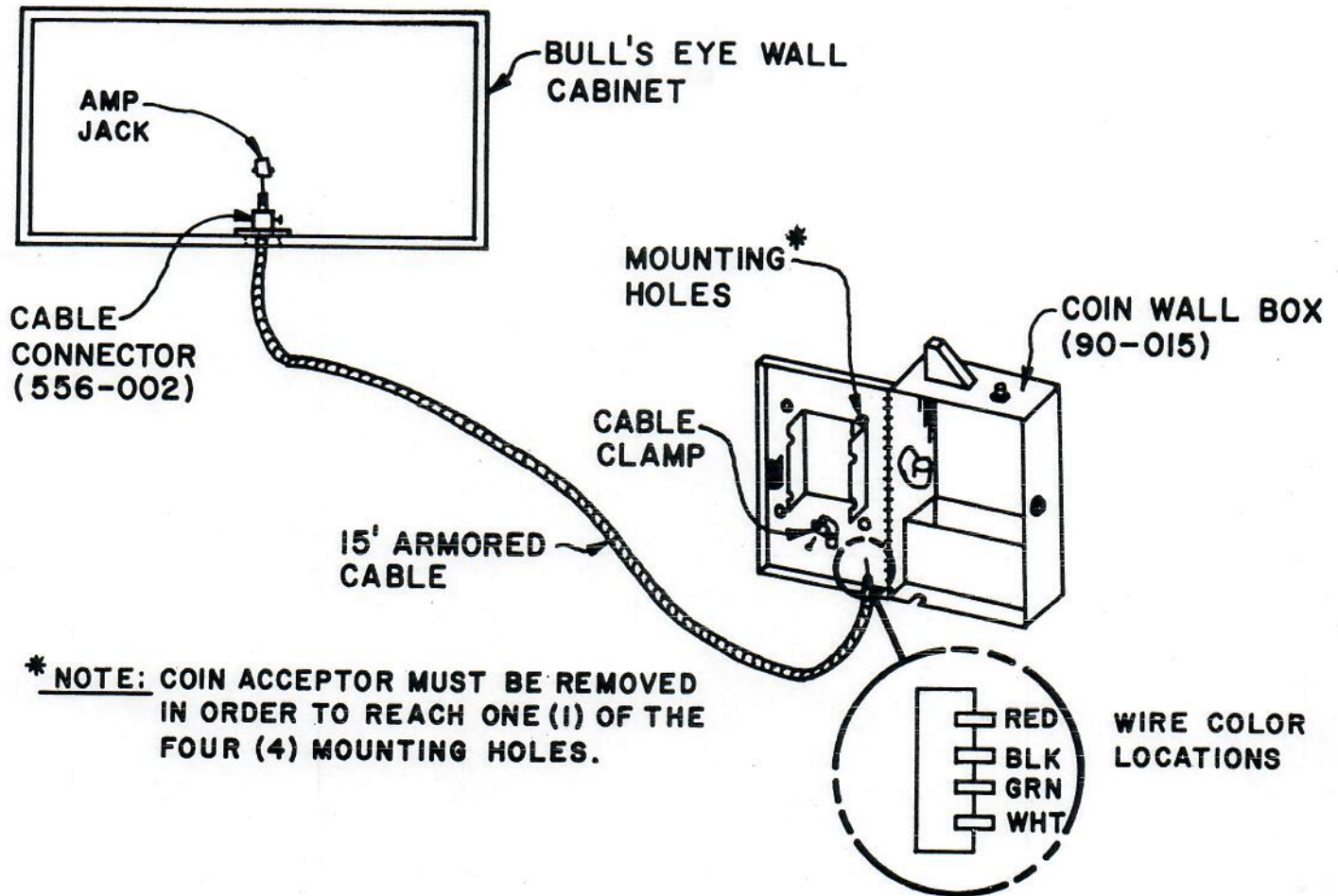
ALTERNATE METHOD FOR HANGING "BULL'S EYE" CABINET



1. BULL'S EYE WALL UNIT MAY ALSO BE HUNG FROM CEILING BY WIRE. TWO (2) 3/16" EYE BOLTS ARE PROVIDED FOR THIS PURPOSE.
2. DRILL TWO (2) 3/16" DIA. HOLES, 2 INCHES FROM CABINET TOP AND CENTERED ON EACH SIDE. (AS SHOWN ABOVE.)
3. INSERT EYE BOLTS & WASHERS AND SECURE WITH NUTS.
4. CABINET MAY NOW BE HUNG FROM CEILING, IN DESIRED LOCATION, USING SASH CHAIN OR WIRE. (NOT INCLUDED)

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COIN WALL BOX MOUNTING INSTRUCTIONS FOR BULL'S EYE

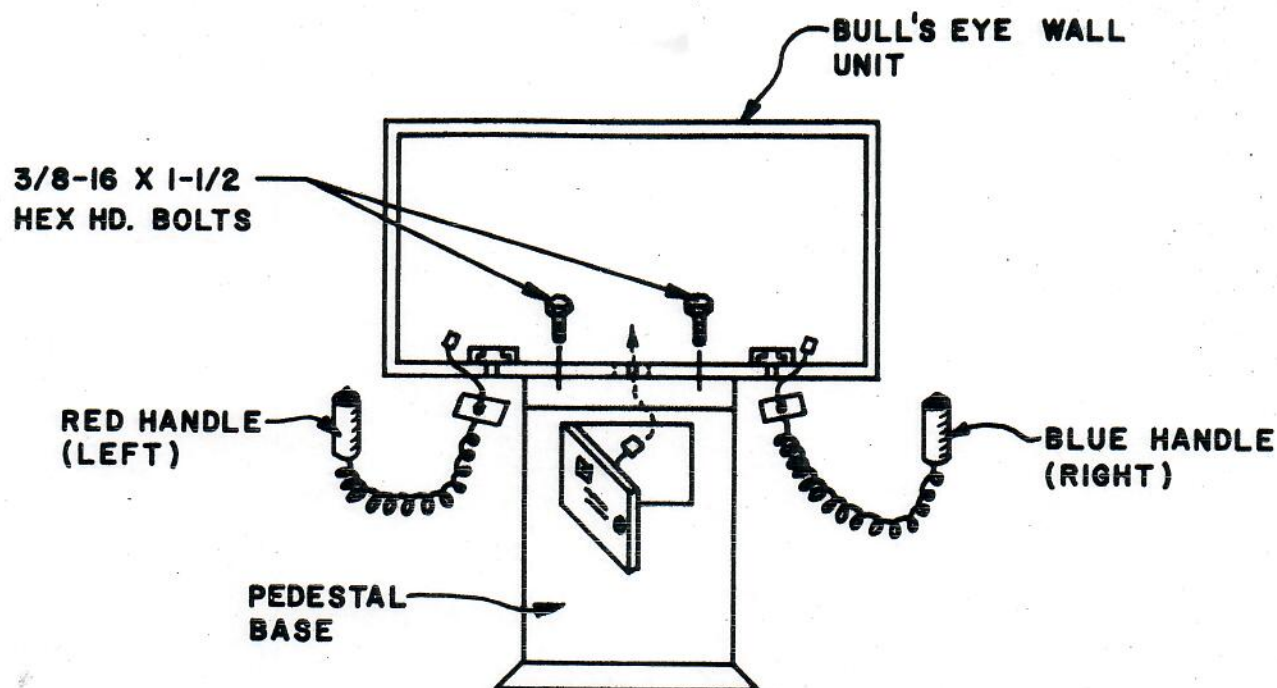


SUGGESTED METHODS OF HANGING COIN BOX

1. PLACE COIN BOX IN DESIRED LOCATION ON WOODEN WALL OR POST, AND SECURE WITH WOOD SCREWS (#8 X 1 1/2) PROVIDED.
2. ON WALLBOARD OR PLASTER WALLS, TOGGLE OR MOLLY BOLTS MAY BE USED TO MOUNT COIN BOX.
3. OR FASTEN WOODEN BOARD TO WALL AND MOUNT COIN BOX TO BOARD WITH WOOD SCREWS (#8 X 1 1/2) PROVIDED.

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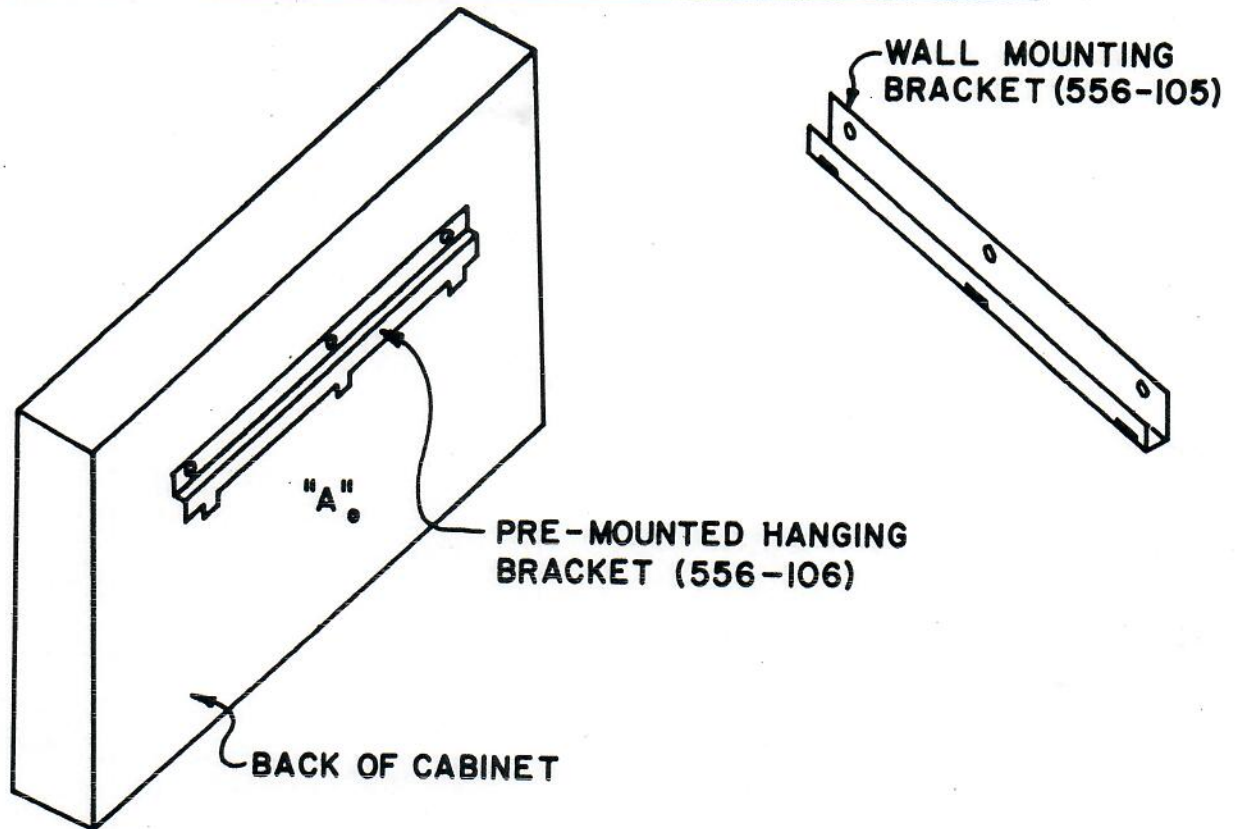
BULL'S EYE PEDESTAL MOUNTING INSTRUCTIONS



1. REMOVE GLASS FRAME FROM WALL UNIT. PLACE UNIT ON TOP OF PEDESTAL BASE AND ALIGN HOLES. SECURE WITH TWO (2) 3/8 - 16 X 1 1/2 HEX HD. BOLTS PROVIDED.
2. OPEN COIN DOOR ON PEDESTAL BASE AND PUSH AMP JACK UP THROUGH CENTER HOLE. PLUG INTO MATING JACK IN WALL UNIT.
3. IF CONTROL SWITCHES ARE USED, INSTEAD OF REMOTE CONTROL BOXES, INSTALL AS SHOWN ABOVE. PLACE RED HANDLE ON LEFT SIDE FOR 1st PLAYER, AND BLUE HANDLE ON RIGHT SIDE FOR 2nd PLAYER. SLIDE RESPECTIVE PLATES IN SLOTS PROVIDED ON EACH SIDE, AND PLUG INTO MATING JACKS IN WALL UNIT.
4. REPLACE GLASS FRAME AND LOCK. CHECK OUT BY OPERATING GAME ELECTRICALLY.

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BULL'S EYE WALL MOUNTING INSTRUCTIONS



1. DETERMINE LOCATION AND DESIRED HEIGHT FOR MOUNTING CABINET TO WALL.
2. THE WALL MOUNTING BRACKET HAS THREE (3) HOLES ON 16" CENTERS FOR SECURING INTO STUDS BEHIND WALL. LEVEL BRACKET AT DESIRED HEIGHT, AND SECURE THROUGH WALL TO STUDS WITH WOOD SCREWS (1/4 X 1-1/2) PROVIDED.
3. IF STUDS CANNOT BE LOCATED, THE WALL MOUNTING BRACKET MAY BE SECURED TO WALL WITH TOGGLE-BOLTS (1/4-20 X 3") PROVIDED. DRILL 5/8" HOLE FOR TOGGLE-BOLTS. IN ALL CASES, IT IS IMPORTANT TO LEVEL BRACKET BEFORE DRILLING HOLES AND SECURING.
4. AFTER THE WALL MOUNTING BRACKET IS SECURED TO WALL, HANG CABINET ON WALL. MAKE SURE THE THREE (3) TABS ON THE CABINET BRACKET FALL IN SLOTS ON THE WALL BRACKET.
5. OPEN FRONT OF GAME. GLASS FRAME IS REMOVABLE TO FACILITATE WORKING ON GAME AND INSTALLATION.
6. SECURE CABINET TO WALL, FROM INSIDE, THROUGH HOLE "A" WITH WOOD SCREW (1/4 X 1-1/2) AS SHOWN ABOVE.

Bull's Eye

CABLE ADDRESS
"MIDCO"



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S E R V I C E B U L L E T I N

Bull's Eye

Game #1219 and on

On remote games only - Improper re-setting when 2nd player shoots last shot, while first player holds button down.

MAKE THE FOLLOWING CHANGE:

1. Remove yellow wires from the MT-30 transformer center tap and separate.
2. Solder the yellow wire from the receiver system cable amp jack to the blue-white wire push button relay. (Add additional wire.)
3. Solder the remaining yellow wire to transformer center tap.
4. Check game electrically.

Game #1385 and on

Index reset relay coil change from M33-1700 to M 32-1500. This prevents dart lights from changing course.

Game #1750 and on

To eliminate buzzing of Lock Relay under certain conditions after game is over:

1. At Lock Relay, cut jumper wire between grey wire and coil lug.
2. Solder IN-4004 Diode between grey wire and coil lug. Make sure that positive side of diode is on coil lug.

Game #2301 and on

New remote system operates game with either one or two transmitter boxes. This new control box setting allows the operator to place the control jack in:

1. Top position permits receivers to operate from either "Hank" or "Iggy" transmitter box.
2. Bottom position requires both transmitter boxes for normal operation.

Game #2350 and on

To prevent over-heating and loss of torque in the score package, and to prevent jammed motor, replace motor with fan-incorporated type motor. (40-2105)

Game #2600 and on

To prevent crystal damage when transmitter box is dropped, the crystal is shock mounted.

Bull's Eye

Trouble Shooting Scoring.

COMPLAINT:

The game over scores and scores on wrong player.
(player loses his turn)

POSSIBLE CAUSE:

1. Control cam stalls. (weak clutching)

PROBABLE REMEDY:

1. Lubricate Control Disc. (PC 556-904).
2. Adjust Control Cam wipers with less tension.
3. Change to stronger compression spring.
(or stretch spring)

COMPLAINT:

When dart hits target the score value lite does not stay on and game registers wrong score.

POSSIBLE CAUSE:

1. The Score Value Lite Relay pulses but fails to hold.

PROBABLE REMEDY:

1. Clean and adjust Push Button Relay switch contacts.
(two jumper wires)
2. Clean and adjust Score Value Lite Relay switch contacts.
(Black-White and jumper wire)

NOTE:

- When adjusting and cleaning contacts turn off power to game.
- The Control Motor is operated by 117 Volts. (40-2105)

BULL'S EYE EQUIPMENT CHART

COIL	PER GAME	APPLICATION
K-29-1100 D.C.	7	Score Value, 1st and 2nd Player 10-90 Score, Control, Credit, Player Up and Dart Flash Units Release Coils.
M-33-1700 D.C.	11	Push Button, Score Value Lite, Start Score, Lock, Game-Over, 96°, O°, Start, Credit, Index Trip and Index Reset Relay Coils.

MISCELLANEOUS

MT-30	1	60 cycle	Transformer
MT-31	1	50 cycle	Transformer
40-2105	1	60 cycle	60 R.P.M. Control Motor
40-2106	1	50 cycle	60 R.P.M. Control Motor

PRINTED CIRCUITS

556-900	1	Dart Flash Disc
556-901	1	Score Value Lite Disc
556-905	2	1st and 2nd Player 10-90 Score Disc
556-906	1	Player Up Disc
556-907	1	Diode Board
556-908	1	Diode Board
556-909	1	D.C. Power Supply Disc
556-910	2	1st and 2nd Player Transmitter Disc
556-911	1	Relay Driver Disc
556-915	2	Receiver Disc

RIVETED DISC

556-904	1	Control Disc
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Bull's Eye

Trouble Shooting Remote Control System.

COMPLAINT:

The game will reset when coin box is operated, but will not reset when 1st player remote unit is operated (with credits).

CHECK THE FOLLOWING:

1. Game Over Relay switch adjustment (Red-Black and Brown-White).
2. Receiver Relay Driver unit jack connections #1, #3, #5 and #12 (PC 556-911).
3. Receiver System cable jack connections - Yellow-Black and Black-Red. (Note: This jack is behind lite insert).
4. Receiver Relay Driver unit (PC 556-911) (1st player).
5. Receiver unit, 1st player (PC 556-915).
6. Remote transmitter unit, 1st player (PC 556-910).

COMPIAINT:

1st or 2nd player remote unit fails to start arm and dart operation. (Game operates with cable control switches).

CHECK THE FOLLOWING:

1. Receiver system cable jack connections, Red-Yellow and Brown (1st player) Orange-Green and Red (2nd player).
2. Receiver Relay Driver unit jack connections, #2, #4, #6 and #7, (1st player), #8, #9, #10 and #11 (2nd player).
3. The receiver relay driver unit (PC 556-911).
4. 1st or 2nd player receiver units (PC 556-915).
5. Remote transmitter units (PC 556-910).

The Remote Transmitter Unit operates with two 9 volt batteries mounted in parallel.



Bull's Eye

Trouble Shooting Scoring.

COMPLAINT:

The dart and score value alters when dart is in target area.
(Sudden change in direction)

POSSIBLE CAUSE:

1. The Index Relay fails to reset properly.

PROBABLE REMEDY:

1. Adjust wiper's Score Value Unit Disc Cam. (PC 556-901)
2. Lubricate and re-adjust Index Relay. (Interlock type)
3. Change to a weaker Index Relay Reset armature spring. (Red)
4. Change Index Relay Reset coil from M33-1700DC to M32-1500DC

COMPLAINT:

The dart hits the target but the game fails to score or change player.

POSSIBLE CAUSE:

1. The Start Score Relay fails to energize.

PROBABLE REMEDY:

1. Clean and adjust Credit Relay switch contacts.
(Yellow and jumper)
2. Clean and adjust 96° Relay switch contacts.
(Black-Green and jumper)
3. Open diodes (two diodes IN 4004) Start Score Relay.
(Red-Green)
4. Open Start Score Relay Coil. (M33-1700DC)

Bull's Eye

Trouble Shooting Remote Control System.

COMPLAINT:

The 1st player (Hank) or 2nd player (Iggy) Transmitter fails to operate.

CHECK THE FOLLOWING:

1. Proper Transmitter and Receiver frequency match.
2. Weak or dead batteries. (two 9 volt in parallel)
3. Defective Push Button switch or associated wiring.
4. Transmitter crystal damage. (Box dropped)
5. Transmitter componet soldering or damaged printed circuit board. (PC 556-910)
6. The Transmitter Unit adjustment.

An easy method to test Transmitter output signal: (Hank or Iggy)

- A. Hold Transmitter near a Transistor Radio. (Full Volume)
- B. Press Transmitter Push Button.
- C. Listen for Transmitter output signal.

TEST PROCEDURE FOR 1624 RECEIVER

Equipment required

1. R.F. Signal generator (Hewlett-Packard 606, 608 or equivalent).
2. Audio generator capable of 8.5 KHz output.
3. Frequency counter capable of counting 27 MHz.
4. Voltmeter (20,000 ohms/volt D.C. or better).
5. Oscilloscope.
6. Power supply.
7. Relay (6 VDC).

Test Procedure

Check test equipment.

Prior to production testing all test equipment must be checked for proper operation and required mode for receivers be tuned. R.F. and A.F. generators set to the proper frequencies. Power supply set to proper voltage.

1. Set power supply to proper voltage and connect to receiver.
2. Connect relay between receiver output (collector of Q7, green wire.), and the regulated 10 VDC buss.
3. Connect oscilloscope to audio coil (center pin).
4. Connect counter to R.F. generator output and set for proper frequency.
5. Set A.F. generator to proper frequency and modulate R.F. generator 100%.
6. Apply power to receiver.
7. Check regulated voltage of receiver with voltmeter. It should be 10 VDC ± 0.5 VDC.
8. With voltmeter measure voltage of the collector of Q2 (oscillator).

With hex tuning tool adjust L2 (oscillator coil) until oscillator starts. (An increase in Q2 collector voltage will occur when oscillator starts). The oscillator should be started by turning the slug up out of the coil (counter-clockwise). When oscillator starts give slug 1/4 turn more counter-clockwise. Remove voltmeter from Q2 collector.

9. Connect generator output cable to the center tap of L1. Set trim pot (R19) to zero resistance (counter-clockwise).
10. Increase R.F. generator output until a signal is seen on the scope. Tune L1, T1, T2, T3 and L3 for maximum, reducing the generator output as signal on scope increases. When maximum tuning is reached check sensitivity. Adjust trim pot for relay pull in of $10 \text{ uv} \pm 0.5 \text{ uv}$.
Turning pot clockwise will reduce sensitivity.

DISTANCE CHECK FOR 1624 RECEIVER

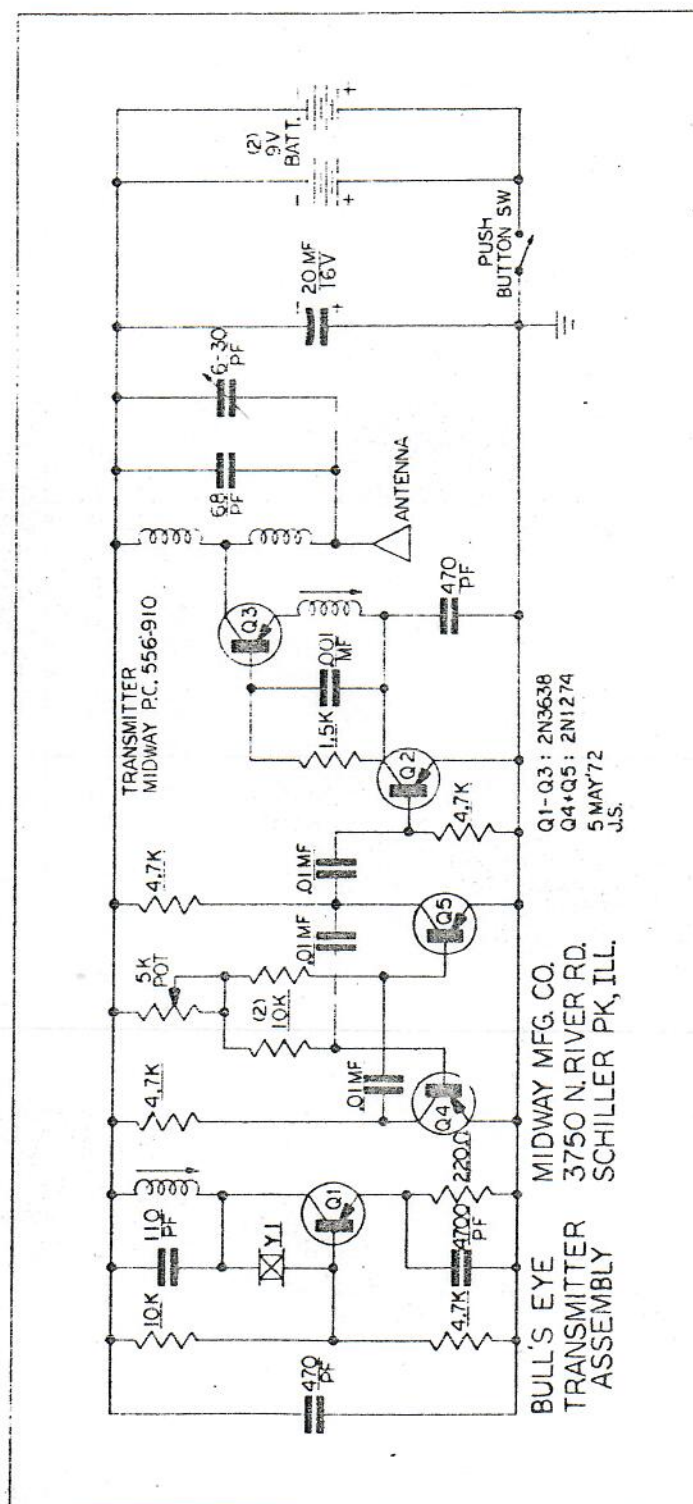
Set up receiver on bench in shed.

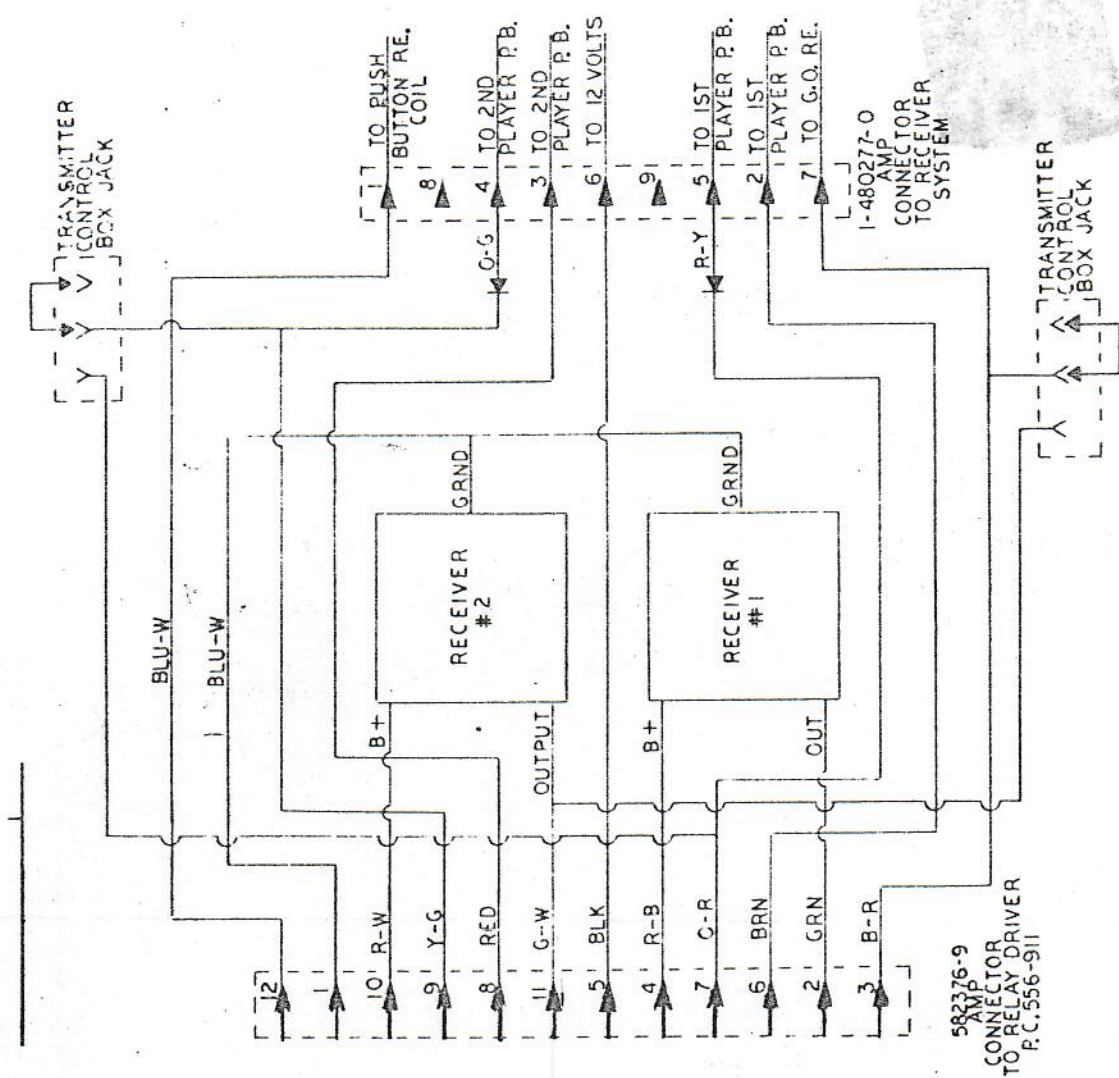
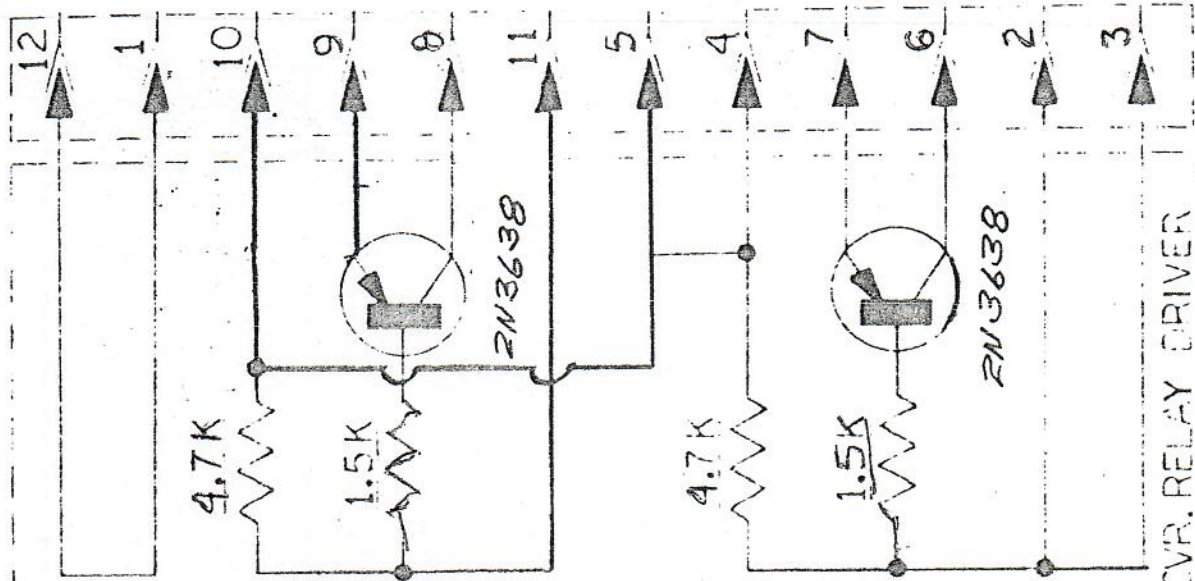
Connect power and delay.

Hook antenna wire in vertical plane, clear of surrounding objects as possible.

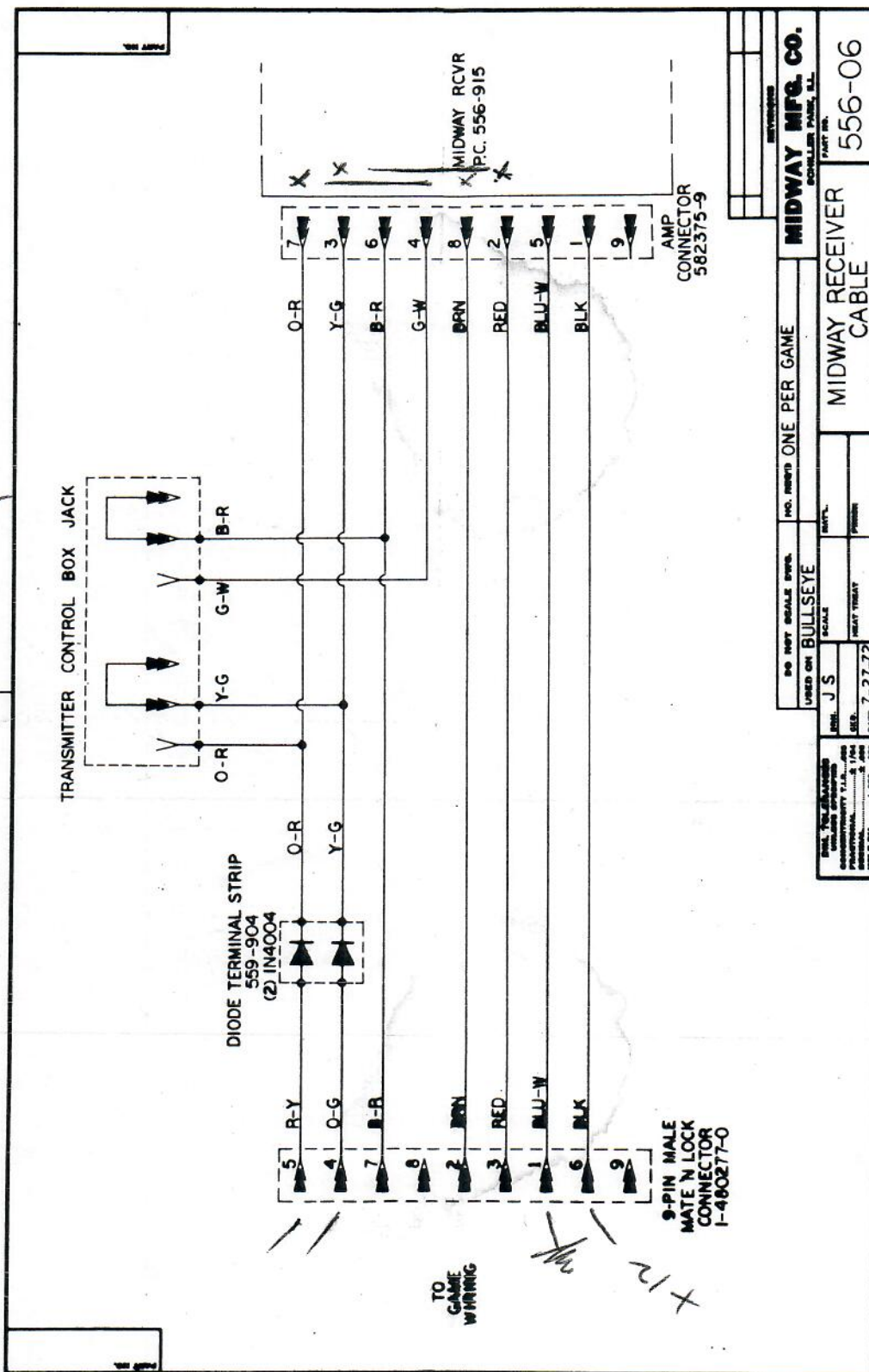
Transmitter shall operate receiver a minimum of 100 feet open air.

This completes operational check.





3/4 50
3/4 50



MIDWAY MFG. CO.
SCHELLER PARK, ILL.

556-06

MIDWAY RECEIVER
CABLE

NO. 10075 ONE PER GAME

USED ON BULLSEYE

SCALE

DATE 7-27-72

BY

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