

6DS7

INSTRUCTION MANUAL

ACE

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CONTENTS

Tips To The Operator	Page 1
I. Game Sequence	Page 2
II. Relay Functions	
A. Start Relay (K1)	Page 4
B. Game Relay (K2)	Page 4
C. Machine Gun Relay (K3)	Page 5
D. Explosion Relay (K4)	Page 5
E. Bonus Relay (K5)	Page 5
F. Hit Relay (K6)	Page 6
III. Motors	
A. Crash Motor (M1)	Page 6
B. Target Disc Motor (M2)	Page 7
C. Tracer Motor (M3)	Page 7
D. Main Timing Motor (M4)	Page 7
IV. Cam Switch Functions	
A. Crash Disc Motor Cam Switch (M1-CS1)	Page 7
B. Crash Disc Motor Cam Switch (M1-CS2)	Page 8
C. Crash Disc Motor Cam Switch (M1-CS3)	Page 8
D. Main Timing Motor Cam Switch (M4-CS1)	Page 9

V. Phototransistor Board	Page 9
VI. Adjustments	
A. Volume	Page 9
B. Treble	Page 10
C. Game Timing Switch	Page 10
D. Bonus Timing	Page 10
E. Focus	Page 10
Alignment Procedures	Page 12

TIPS TO THE OPERATOR

1. The sound level is factory set on maximum volume.
(see volume control VI-A).
2. Length of game can be set with timer switch (SW-1)
option of 60 seconds, 90 seconds, 120 seconds.
3. The player must track target and hold target in
sights for about one-half second to record hit
(see game sequence).
4. Fire at airplane engine.
5. CAUTION: The game has been properly aligned at
the factory. There should be no need
for further alignment.
6. Do not make any adjustment without reading the
manual.

I. GAME SEQUENCE

The game is started by inserting a coin.

Inserting a coin will:

- 1) Reset the score to zero
- 2) Start the main timer motor
- 3) Start the target disc motor
- 4) Turn on the projector lamp
- 5) Turn on the phototransistor lamp
- 6) Start the tracer motor (tracers will not be seen until player shoots).
- 7) Apply power to the sound system causing the airplane motor sound

The player can now align the targets in the sight by moving the control stick. When the player pushes the machine gun pushbutton the machine gun sound is heard and the tracers appear on the screen.

The player must track (while shooting) the target for about one half second in order to score a hit.

When the player scores a hit:

- 1) The hit disc starts and a smoke screen is seen
- 2) A dive sound is heard
- 3) An explosion is heard
- 4) A red flash explosion is seen
- 5) The player is credited with a hit on the score panel

If, at any time in the game, the player scores eight hits, he is awarded a bonus time of thirty (30 seconds). The main timer motor stops during the bonus period. At the end of the bonus time, the player continues until the main time runs out. A light on the front panel flashes to indicate the bonus situation.

Twelve hits makes the player an "ACE", as indicated by the last hit light on score panel. The 13th hit will be indicated by the "ACE" light staying on and the hit #1 light coming on again. Succeeding hits will be indicated by #2, #3, etc. When the main timer motor is used up, all of the motors stop and the flashing "BACK SCREEN" light comes on.

II. RELAY FUNCTIONS

A. Start Relay (K1)

Energized by inserting a quarter or pushing the credit button, and remains energized until the Main Timer Cam Switch (M4-CS1) switches.

- 1) Keeps timer motor and target motor energized until the Main Timer Cam Switch (M4-CS1) switches and energizes Game Relay (K2).
- 2) Resets the score stepper switch to zero.
- 3) Enables credit circuit every alternate cycle.

B. Game Relay (K2)

Energized by Main Timer Cam Switch (M4-CS1), and held energized until the game is over.

- 1) Turns off screen back light
- 2) Starts the tracer motor, turns on projector lamp and energizes sound system
- 3) Disables credit pushbutton circuit and drops out Start Game Relay (K1).
- 4) Enables the machine gun trigger and tracer lamp circuit and applies power to Main Timer and Target Motors.

C. Machine Gun Relay (K3)

Energized only as long as the Button is pushed on the machine gun.

- 1) Turns on the tracer lamp
- 2) Energizes the Hit Relay (K6) if the player is on target
- 3) Starts the machine gun sound

D. Explosion Relay (K4)

Energized when the machine is plugged in. De-energized when the crash disc cam switch (M1-CS2) switches at the end of crash sequence. The following occur when K4 de-energizes:

- 1) Energizes Score Unit set coil, adding one point to the player's score and disables trigger and trigger tracer circuit.
- 2) Starts explosion sound
- 3) Energizes Bonus timer board if bonus level has been reached

E. Bonus Relay (K5)

Energized by the Bonus timer board when the player scores the 8th hit. It remains energized until the

timer board times out (factory set at 30 seconds).

- 1) Stops the main timer motor
- 2) Turns on flashing Bonus light

F. Hit Relay (K6)

Energized by a player being on target (photo-transistor board (PC-2) and the Machine Gun Relay (K3) being fired.

It remains energized until crash disc cam switch (M1-CS2) switches.

- 1) Starts the crash disc motor
- 2) Energizes the Hit Flash lamp(150W) for visual explosion
- 3) Stops the machine gun sound
- 4) Starts the dive sound

III. MOTORS

A. Crash Disc Motor (M1)

Started by Hit Relay (K6). The Crash Disc motor cam switch (M1-CS1) closes when the motor starts and keeps it running for one-half revolution. The cam switch then opens stopping the motor.

B. Target Motor (M2)

Started by energizing Start Game Relay (K1) and held on by Game Relay (K2). Turned off by de-energizing Game Relay (K2) at the end of game. Moves the targets.

C. Tracer Motor (M3)

Started and stopped by the Game Relay (K2). The tracers are not seen on the screen until the player pushes the button which turns on the tracer lamp.

D. Main Timing Motor (M4)

Started by inserting a coin and kept running by Start Relay (K1) until the Main Timer Cam Switch switches. The Main Timing Cam Switch (M4-CS1) then keeps M4 running for one revolution at which time the cam switch opens de-energizing the motor. M4 is stopped during the bonus period by the Bonus Relay (K5).

IV. CAM SWITCH FUNCTIONS

A. Crash Disc Motor Cam Switch (M1-CS1)

One contact is open when the crash sequence starts. A complete hit sequence consists of one-half revolution of the Crash Disc. A hit starts the Crash Disc Motor

causing the open contact to close after approximately one-eighth revolution. This contact keeps the Hit Disc Motor running until M1-CS1 opens again. The other contact is closed when the crash sequence starts. The explosion lamp is energized through the closed contact. After approximately one-eighth revolution of the crash disc, the contact opens turning off the explosion lamp.

B. Crash Disc Motor Cam Switch (M1-CS2)

One contact is closed when a crash sequence starts. After approximately three-eighths (3/8) of a revolution of the Crash Disc, the closed contact opens briefly. This de-energizes Explosion Relay (K4) and Hit Relay (K6) and adds one point to the player's score. The other contact is open when the crash sequence starts. After approximately three-eighths (3/8) of a revolution of the Crash Disc, it closes briefly, shorting out the charge on Capacitor C3 through the 33 ohm resistor R11.

C. Crash Disc Motor Cam Switch (M1-CS3)

Opens when the crash sequence starts. After approximately three-eighths (3/8) of a revolution of the Crash Disc, it closes briefly energizing the 150 watt red

lamp momentarily causing a red flash to be seen.

D. Main Timing Motor Cam Switch (M4-CS1).

Starting the game starts the Main Timer Motor, causing the open contact to close and remain closed for one revolution and holds the Game Relay energized.

V. PHOTOTRANSISTOR BOARD (PC1)

The phototransistor board has an output when light from the phototransistor lamp passes through a code hole in the target disc and is sensed by the phototransistor. This energizes the Hit Relay (K6). To check the board, open the lower front door and stop the airplane disc with switch SW-1. Line up a code hole directly under the phototransistor lamp and push the trigger button. (Do not stop disc for more than twenty (20) seconds.

VI. ADJUSTMENTS

A. Volume

The volume of all the sounds (motor, machine gun, dive, explosion) is set with the potentiometer on the audio chassis.

B. Treble

The treble control (short control arm) is pre-set at the factory for the higher pitch sounds. It is recommended for maximum sound effects that the setting remain at this position.

C. Game Timing Switch (SW-1)

The length of the game can be adjusted for either 60 seconds, 90 seconds or 120 seconds. The time can also be stopped by turning to the OFF position.

D. Bonus Timing

The length of additional playing time for bonus is set at 30 seconds at the factory. The trimpot located on the bonus printed circuit board (PC1) on the bottom of the lower chassis sets this time.

E. Focus

The focus is pre-set at the factory and should not need adjustment. If, however, adjustment is needed the procedure is as follows:

- 1) Stop target in the center of the screen by turning off the switch (SW-1).

CAUTION: Do not leave airplane disc stopped excessively long since heat from projector lamp can damage the disc (20 second maximum).

- 2) Loosen the set screw of the lens (located under the lower chassis) and move the lens up or down as required until the picture is in focus and re-tighten the set screw.

ALIGNMENT PROCEDURE

The Ace requires alignment between the projected image on the screen and the code holes on the disc to score hits.

This procedure will tell you how to do this:

A hit is scored when the button is pressed for at least $\frac{1}{2}$ second while the photocell sees light through a target score hole in the airplane disc. In order for the player to tell when he is aligned, the projection of the airplane image on the screen must be aligned with the point of the "v" formed by the tracers aimed at the engine.

Each machine is aligned at the factory, no further alignment should be necessary unless the adjustable mirror has been tampered with or damaged in shipment.

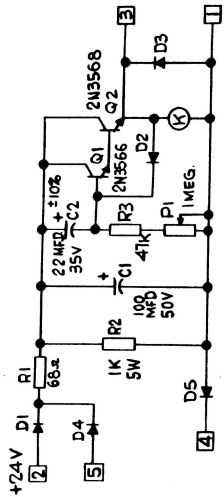
For any alignment modifications use only the adjustable mirror for minor adjustments.

Check for correct alignment as follows:

- 1) Open rear and lower front doors
- 2) Make sure lower chassis is properly secured in the original factory set position. The lower chassis is

secured in place with one $\frac{1}{4}$ -20 machine bolt located left front lower chassis (access through front door).

- 3) Start game - watch screen for large broadside Focke-Wulff. Push control stick $\frac{3}{4}$ forward and to the right center. Stop airplane disc with stop switch. Push machine gun button. The tracers should point to a "V" on the forward part of fuselage or engine. A hit should be recorded.
- 4) Start airplane disc and track the other airplanes always shooting slightly below the engine and allow the plane to fly into the tracer pattern.
- 5) Play the game further. Try shooting a little high, a little low, a little to the left, a little to the right of the engine. Give the mirror a slight adjustment if needed.
- 6) NOTE: Each plane is coded with the control stick in a different position, generally with the stick $\frac{3}{4}$ forward to all the way forward.



BONUS & ACE TIMER CIRCUIT

NOTE:

1. ALL RESISTORS 1/2 WATT EXCEPT AS NOTED
2. ALL DIODES IN5059

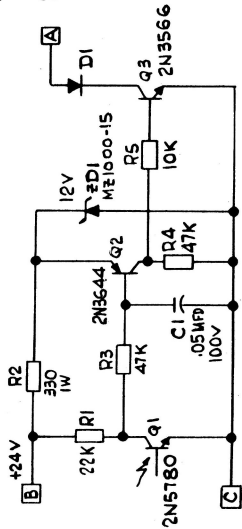


PHOTO TRANSISTOR CIRCUIT