Pentax Program Plus

PENTAX PROGRAM PLUS

Silimar models: Super Program

Batteries: 2 ea S76

Fig. 1— top cover removed

Fig. 2— bottom cover removed

Fig. 3— front view, covers removed

Fig. 4— top view, wind side — shutter-dial board held aside

Fig. 5— front view, mirror box removed

Fig. 6— mirror box, back view

Fig. 7— mirror box, rewind side

Fig. 8— mirror box, bottom view

Fig. 9— underside of shutter-dial board, terminal identification

Fig. 10— test connections, optical encoder

Fig. 11— wiring pictorial, top of flex

Fig. 12— wiring pictorial, side and bottom of flex

ADJUSTMENT LOCATIONS:

Auto exposure	A
Aperture-control voltage	B
LCD alignment (parallel)	C
LCD alignment (height)	D
Mirror angle	E
Travel time, 2nd curtain	F*
Travel time, 1st curtain	G*
Timing switch	H*
AV (f-volume) resistor	I
Shutter release	J

*normally do not disturb — adjustments can't be reached with camera assembled

ADJUSTMENT VALUES:
Curtain-travel time: 6ms (20mm distance), 7.2 ms (24mm distance)

Flange-focal distance: 45.46±0.04mm (flange to film rails)

Aperture-control voltage: 450±50mv peak-to-peak

Battery-test voltage: With 2.6V applied, the LCDs should read normally. With 2.4V applied, the LCDs should alternately show the exposure reading and a row of 0's.

Timer: LCDs should remain on 30 seconds after release button returns

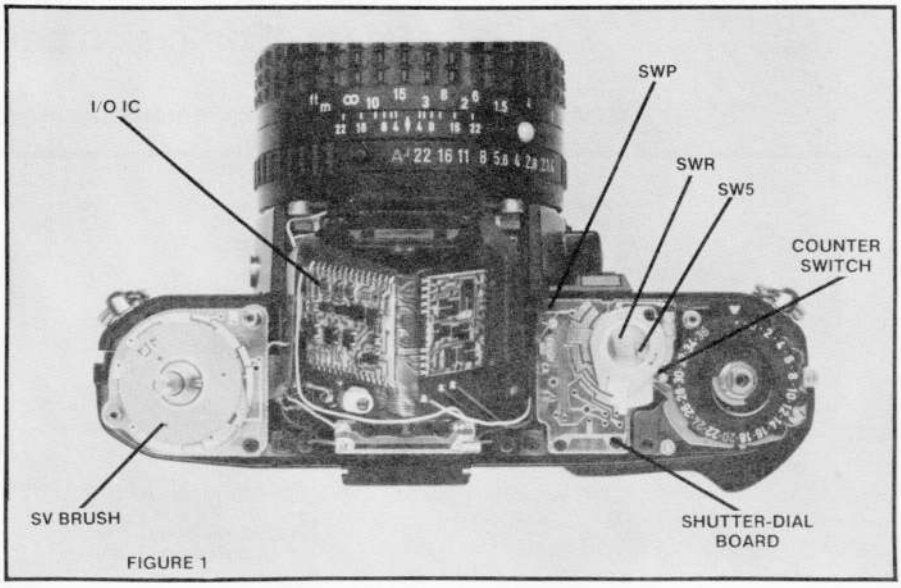


FIGURE 1

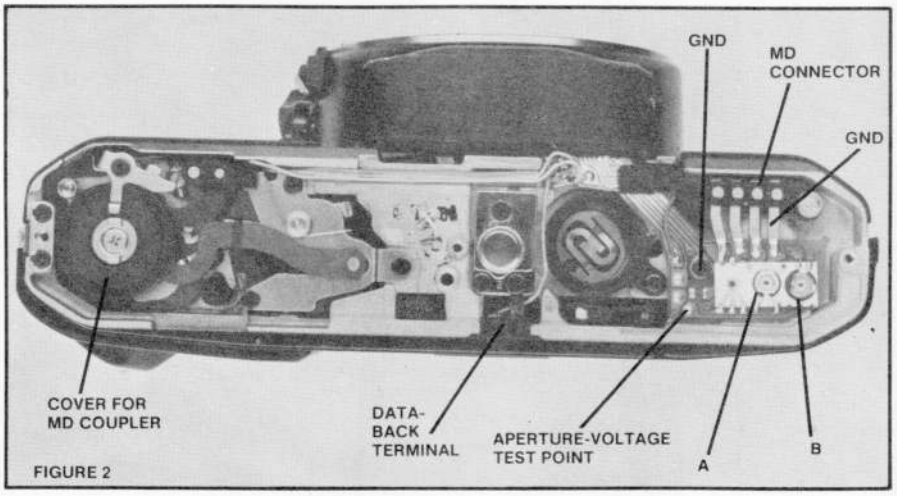


FIGURE 2

Sync speed: 1/100

AV resistor: 6K±10 ohms at f/8

ADJUSTMENT PROCEDURES:

1. AV resistor

   Adjust before installing the mirror box. Install the lens at f/8. Measure the resistance between the yellow and brown AV-resistor wires (disconnected), Fig. 11. Adjust I, Fig. 6, for a reading of 6K±10 ohms.

2. Aperture-control voltage

   a. Set both the lens and the shutter dial to auto.

   b. Connect 2.8V between the battery-box terminal (+) and ground.

   c. Check the f/stop on the LCD to assure that the camera will program an aperture smaller than f/2.8. If not, use a higher light level or a faster film speed.

   d. Connect an oscilloscope between ground and the test point for the aperture-control voltage, Fig. 2. Set a sweep time of 2ms, vertical deflection of .02v/cm, and 10:1 on the probe.

   e. Release the shutter. The scope will display a sine-wave signal. Adjust the trace position until you can measure the P-P voltage of the

sine wave.
f. Adjust B, Fig. 2, for a P-P voltage of 450mv±50mv (2.5cm on the scope, Fig. 12).

3. Exposure

a. Check with the top cover installed. Temporarily install the bottom cover and the batteries. Or use a special bottom cover with a clearance cutout for the resistors, Fig. 2.
b. Set ISO 100, f/8, auto on the shutter dial. Check at EV12. Adjust A, Fig. 2, for an exposure time of 15.6ms (O EV error).
c. Remove the lens and check the manual speeds (no adjustment except for timing-switch eccentric).
d. Check the exposure at program (lens and shutter dial set to auto). The programmed exposure should be within 1 EV at EV16, EV12, EV10, EV8, and EV6.

4. LCD alignment

Adjust C, Fig. 3, to make the LCD parallel with the bottom edge of the focusing screen. Adjust D so that the distance between the bottom edge of the screen and the top edge of the LCD is 1/2 - 1.2 times the width of the LCD.

5. Shutter release

Check by holding the mirror as you push the release button — allow the mirror to move up slowly and note when the shutter releases. The bottom side of the mirror should align with the top edge of the aperture lever (or be no more than half way between the top edge of the aperture lever and the bottom edge of the porous plastic at the top of the mirror box). If not, remove the mirror box and bend the shutter-release lever, Fig. 8. Bend up the long arm to make the shutter release sooner; bend down the long arm to make the shutter release later.

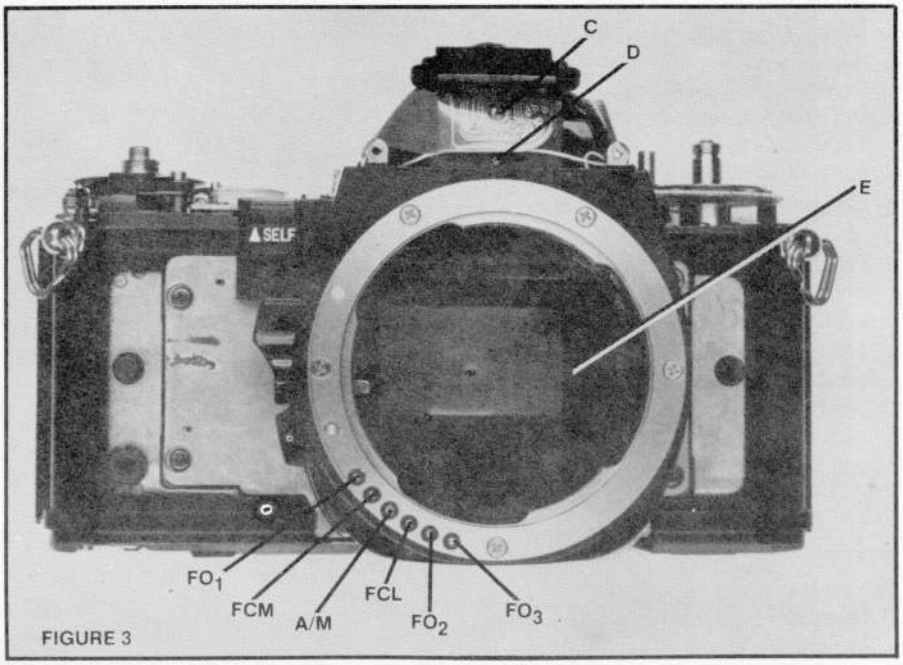


FIGURE 3

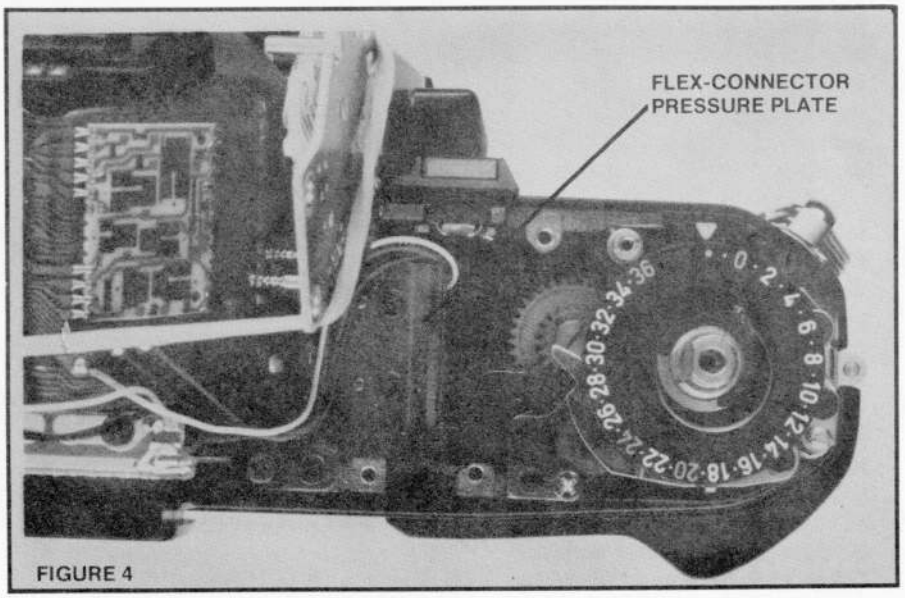


FIGURE 4

OPERATING INSTRUCTIONS:

1. For program operation, set the shutter dial and the lens diaphragm to auto. The LCD in the finder then reads both the shutter speed and the f/stop that will be automatically programmed. Push the release button part way to turn on the LCDs. The LCDs remain on 30 seconds after you allow the release button to return.
2. For aperture preferred, set the shutter dial to auto and the diaphragm to a manual setting. The LCD then shows the shutter speed that will be automatically set. The f/stop LCD has no indication.
3. For metered manual, set the shutter-dial to manual (depress the gray latch button on top of the shutter dial). Select the shutter speed with the up/down keys next to the shutter dial. Also set the lens to a manual f/stop. One LCD (rewind side) now shows the selected shutter speed; the other LCD shows over or under exposure up to 3 stops. For proper exposure, the LCD shows +/- 0.
4. If you set the lens to auto and the shutter dial to manual, 1/100, or bulb, the LCD shows an "E" (flickering) for error. The shutter will not release.
5. As a low-battery warning, the LCD alternates showing the normal readings with "000" in one display and "00" in the other display.

6. The camera provides normal operation with the back open. When you close the back, the LCD indicates "1000." The shutter delivers 1/1000 second until the counter reaches "1."
7. With the dedicated flash, the lightning-flash symbol appears in the display when the flash charges. The display and the shutter speed change to 1/100. At manual shutter-speed settings, the flash changes the display to "100" at speeds 1/125 and faster; the shutter delivers 1/100. At speeds of 1/60 and slower, the shutter delivers the selected speed.
8. For self-timer, move up the self-timer lever (front, wind side). The LED (red window) flashes during the delay (no beeper). The camera will not operate at the bulb setting with the self-timer on (error indication).

LOCATIONS AND FUNCTIONS OF SWITCHES:

1. Metering (main) switch SWS. Tab in center of shutter-dial brush, Fig. 1. Touching SWS to ground (release partially depressed) turns on the metering LCDs for 30 seconds.
2. Release switch SWR. In center of shutter-dial brush ,Fig. 1. Closes with the release button fully depressed. The release capacitor then discharges through the release magnet to release the mirror.
3. Lock switch SWP. Top of shutter-dial board, Fig. 1. Opens at the "L" position of the shutter dial. The metering LCDs then can't turn on and the shutter can't release.
4. Self-timer switch. Back of front plate, Fig. 6. Closes with the self-timer on, causing the self-timer delay.
5. Timing switch. In shutter block, Fig. 5. Closed with the shutter cocked. Opens when the first curtain starts to run, beginning the timing cycle.
6. Winder switch. Bottom of mirror box, Fig. 8. Open with the mirror charged or released. Closed with the mirror up, connecting the green wire to ground (signal for Winder II).
7. Wind-completion switch. Bottom of camera, wind side. Opens when the shutter is fully cocked. When closed, the wind-completion switch inhibits the shutter release.
8. Counter switch. Pin on shutter-dial board, Fig. 1. With the camera back closed, the counter-switch lever moves against the pin (switch closed). At auto, the LCD reads "1000". The LCD shuts off at manual, and reads normally at "100" and "B." The shutter delivers 1/1000 at auto and manual until the counter reaches "1." The counter switch then opens, restoring normal operation.

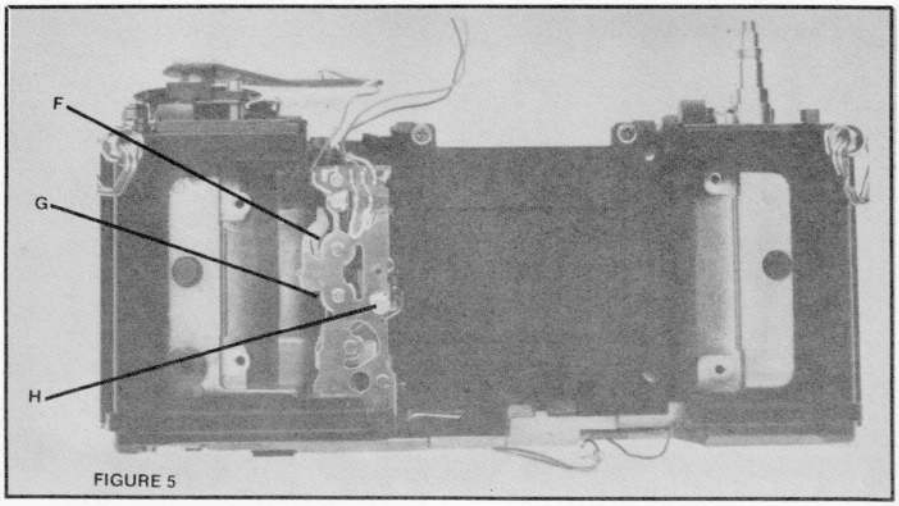


FIGURE 5

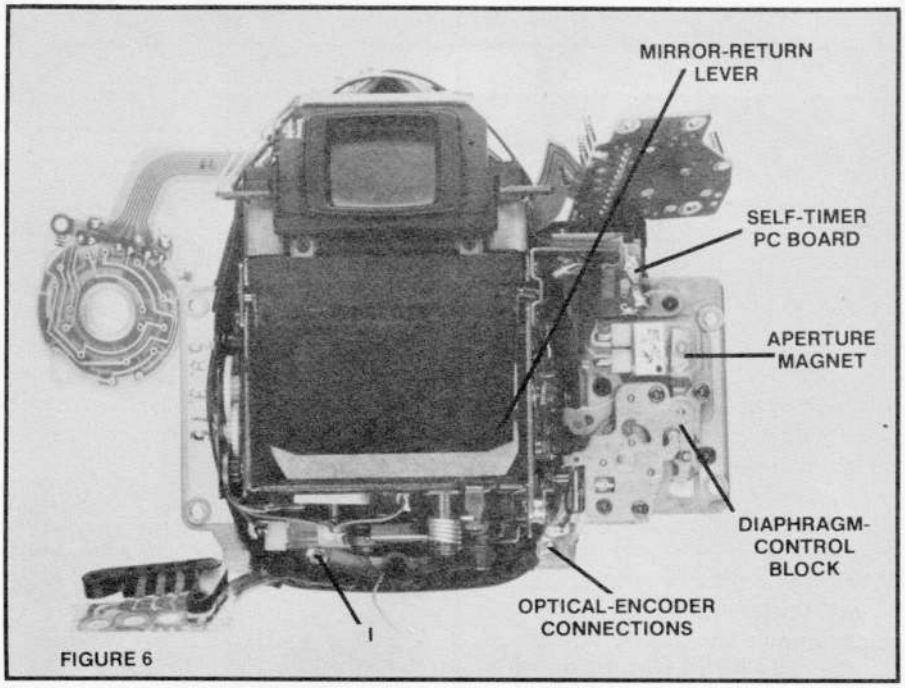


FIGURE 6

SWITCH ADJUSTMENTS:

1. Wind-completion switch
   a. Cock the shutter.
   b. Turn the eccentric on the winding-hook lever (just behind the motor-drive contact on the wind side bottom —push the mirror-charge lever toward the back of the camera to reach) to its farthest position away from the contact of the wind-completion switch.
   c. Bend the contact of the wind-completion switch until it comes against the eccentric.
   d. Adjust the eccentric until the space gap between the contacts of the wind-completion switch is 0.3mm.
2. Winder switch
   a. Charge the mirror box.
   b. Check the clearance between the winder-switch contact and the tab on the switch lever, Fig. 8. The

allowable tolerance is 0.3mm - 0.5mm. However, to assure that the winder will not run with the shutter open, adjust the distance as close as possible to 0.3mm by bending the switch contact.

BASIC CIRCUIT OPERATION:

1. The Program Plus uses the same circuit as the Super Program. However, the T100 flex for the Program Plus eliminates the TTL flash circuit, the LCD lamp, the body LCD circuit, and the piezo beeper.
2. The circuit uses four IC's:
   - Timing IC. Top wind side (underside of flex). Contains the crystal-controlled oscillator for the clock and the driver for the LCDs. Receives the digital SV, mode, lens contact, and counter-switch signals and provides the information to ICA.
   - ICA. Top rewind side (underside of flex). Contains the AV and SV memory circuits to control the shutter speed and aperture. Receives the AV and BV information from the input IC and the mode, lens, and SV information from the timing IC. Provides the release signal for the mirror and the release signals for the SV and AV magnets to the I/O IC.
   - I/O IC. Top rewind side, Fig. 1. Hybrid input/output IC that interfaces ICA to the magnets and switches (SWP, SWS, SWR, self-timer).
   - Input IC. Rewind side of flex, Fig. 7. Receives the analog BV and AV signals, converts the signals to digital values, and supplies the digital signals to ICA. As the diaphragm closes, the input IC receives the count signal from the optical encoder.

3. The oscillator in the timing IC turns on as soon as power is supplied. When you close SWS, the timing IC supplies the square-wave signals that drive the LCDs. The timing IC knows the SV, mode, and lens type from digital signals supplied directly to its inputs. The input IC supplies the BV and AV information, converting the analog input signals to digital signals.

4. When the release switch SWR closes, ICA locks the AV and SV information in memory. The I/O IC tells ICA that SWR has closed.

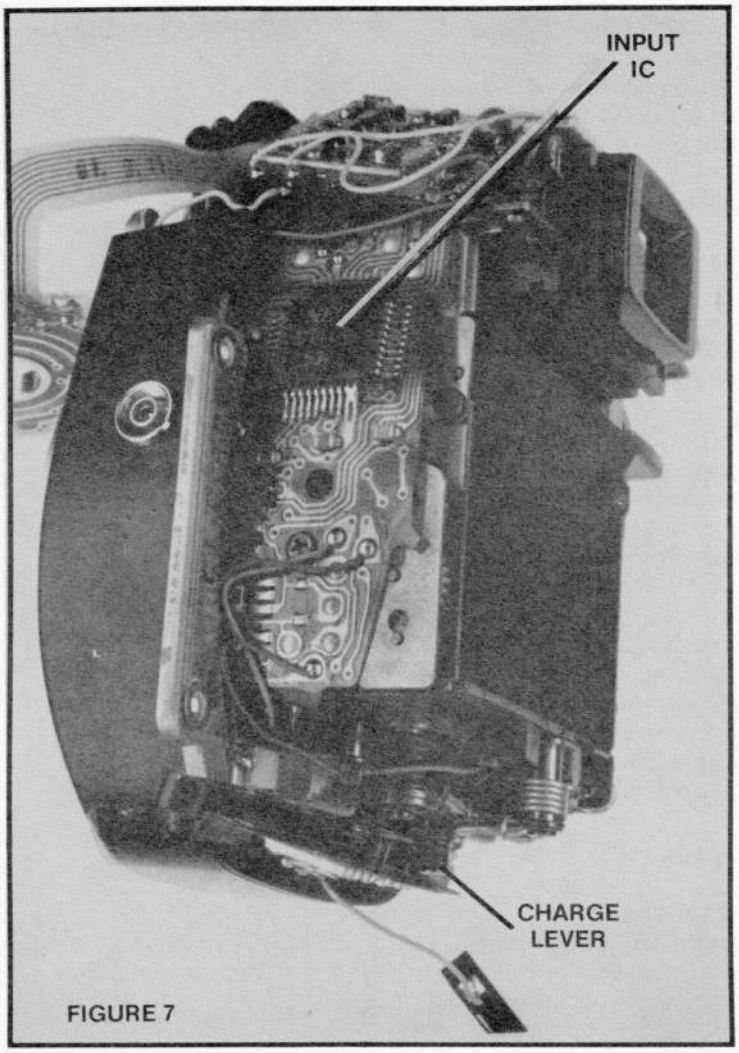


FIGURE 7

In turn, ICA supplies the release signal to the I/O IC. The release signal turns on a transistor in the I/O IC, allowing the release capacitor to discharge through the release magnet.

5. As the mirror rises and the diaphragm closes, the optical encoder supplies a sine-wave signal to the input IC. The input IC converts the sine wave to a square wave and sends the signal to ICA. ICA counts the pulses to determine how far the diaphragm has closed. When the count equals that stored in AV memory, ICA turns on a transistor in the I/O IC. The aperture-magnet capacitor then discharges through the aperture (AV) magnet. The aperture magnet repels its armature to stop the diaphragm closure.

6. The mirror mechanically releases the first curtain in the shutter. As the first curtain runs, it opens the timing switch. The high signal from the timing switch goes directly to ICA. ICA now starts counting clock pulses and comparing the count with that stored in SV memory. When the counts are equal, ICA switches off a transistor in the I/O IC to shut off the shutter-magnet current and release the second curtain.

7. At manual f/stop settings, the A/M switch opens. ICA then doesn't supply the release signal for the aperture magnet. The diaphragm closes to the selected f/stop. At manual shutter-speed settings, you

set the count in the TV register by the up/down keys.

8. The camera draws a slight current whenever batteries are installed to keep the oscillator at the proper frequency and to hold the manual shutter-speed setting in memory. If you remove and then replace the batteries, the manual shutter-speed register is reset to "1000" (1/1000 second).

DISASSEMBLY HIGHLIGHTS:

Settings: bulb, ISO 100

Locations of left-hand threads: nut holding wind lever

Sequence:

1. bottom cover (3 screws — batteries and rewind button loose)
2. cover for MD coupler, Fig. 2 (partially advance wind lever to remove)
3. top cover (Pentax nameplate, wind-lever retaining screw, left-hand wind-lever nut, wind lever and spring washer, rewind knob, film-speed dial, 5 top-cover screws)
4. unsolder gray hot-shoe wire from hot-shoe contact piece, Fig. 11

Reassembly highlights:

1. Before replacing the top cover, set the shutter-dial brush to bulb, Fig. 1. Or set the shutter-dial brush to the setting corresponding to the speed-dial position. To set the different modes with the top cover removed, use the plastic tip of the shutter-dial brush, Fig. 1, as a reference:

   Auto — tip pointing between the rivets of the lock switch.

   Manual — tip pointing to hole in shutter-dial board between up/down keys.

   100 — tip pointing to next hole in shutter-dial board (7 o'clock).

   Bulb — tip pointing to back of camera.

2. Set the SV brush to ISO 100 (cutout at an 8 o'clock position, over the board contact).
3. After replacing the top cover, seat the film-speed dial at ISO 100; align the 1x calibration with the index. Alternately, you can simply align the 1x calibration with the index; then depress the film-speed latch and rotate the film-speed dial until its tab drops into the cutout of the SV brush.

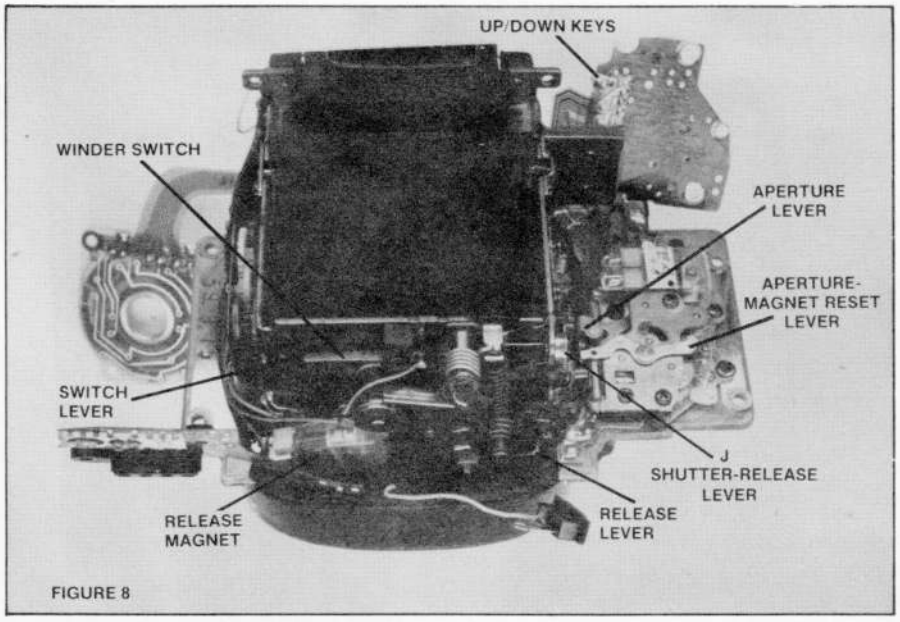


FIGURE 8

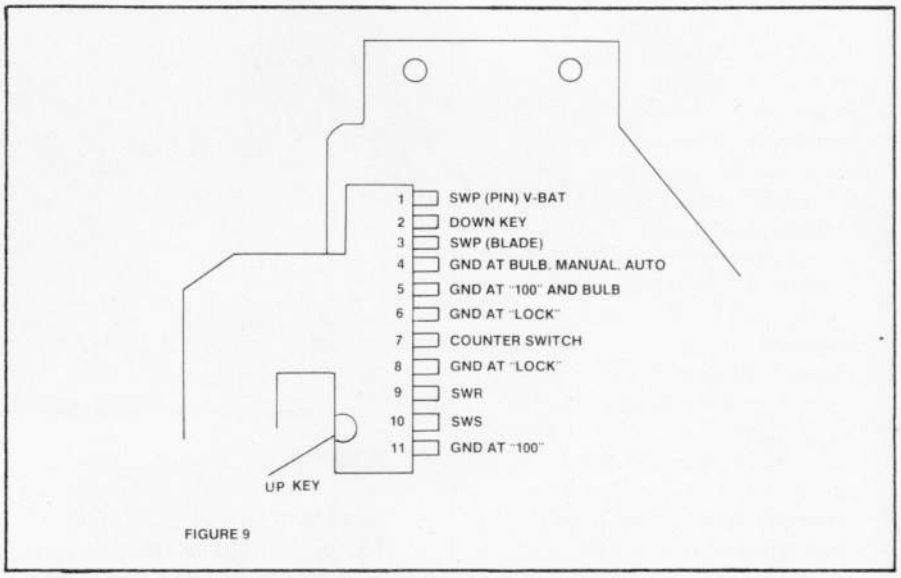


FIGURE 9

Sequence to remove mirror box and shutter block:

1. unsolder gray X-sync wire from hot-shoe contact piece, Fig. 11
2. unsolder shutter wires from top of flex (white, brown, red, Fig. 11)
3. unsolder wires from bottom of flex (orange, red, sky blue, purple, Fig. 12)
4. remove screw and lift aside data-back terminal, Fig. 2.
5. remove 2 screws holding MD connector, Fig. 2.
6. remove 3 screws holding SV block, Fig. 1 (long post screw to front of camera, short post screw to end of camera) — lift SV block clear of rewind shaft
7. set shutter-dial brush to bulb and remove 3 screws holding shutter-dial board, Fig. 1
8. separate shutter-dial board from body casting

9. cock shutter
10. remove 2 upper mirror-box screws (by eyelens)
11. loosen 2 screws holding eyelens frame
12. remove right and left front leather
13. remove 4 front-plate screws
14. lift out front-plate/mirror-box assembly
15. remove shutter block (2 screws at top front, 1 screw at back of aperture)

Reassembly highlights:

1. To replace the mirror box, first cock the shutter. The mirror box should be released with the mirror down.
2. To check the assembly after installing the mirror box, advance the wind lever to charge the mirror. Release the mirror by pushing forward the mechanical release accessible through the clearance cutout, Fig. 2.

Sequence to remove flex circuit T100:

1. remove flex-connector pressure plate, Fig. 4 (2 screws)
2. remove flex-connector pressure pad (under pressure bar)
3. separate T100 flex from locating pins on support plate
4. remove 2 screws holding finder LCD
5. unsolder wires from side of flex, Fig. 12 (orange, blue, green)
6. unsolder wires from top of flex — yellow, brown (AV resistor), pink, blue (hot-shoe contact piece)
7. unsolder gray wire (flash terminal) from hot-shoe contact piece
8. remove hot-shoe contact piece (2 screws)
9. lift photocell board free of slot in eyepiece frame
10. remove flex screw, rewind side of mirror box
11. remove flex circuit T100

Sequence to remove mirror box:

1. desolder aperture-magnet leads from connector board, Fig. 6.
2. desolder connector board from optical-encoder connections, bottom of diaphragm-control block, Fig. 6
3. remove diaphragm-control block (2 screws)
4. raise the mirror (charge the mirror box — then push the release lever of the release-magnet block toward the front of the mirror box, Fig. 8)

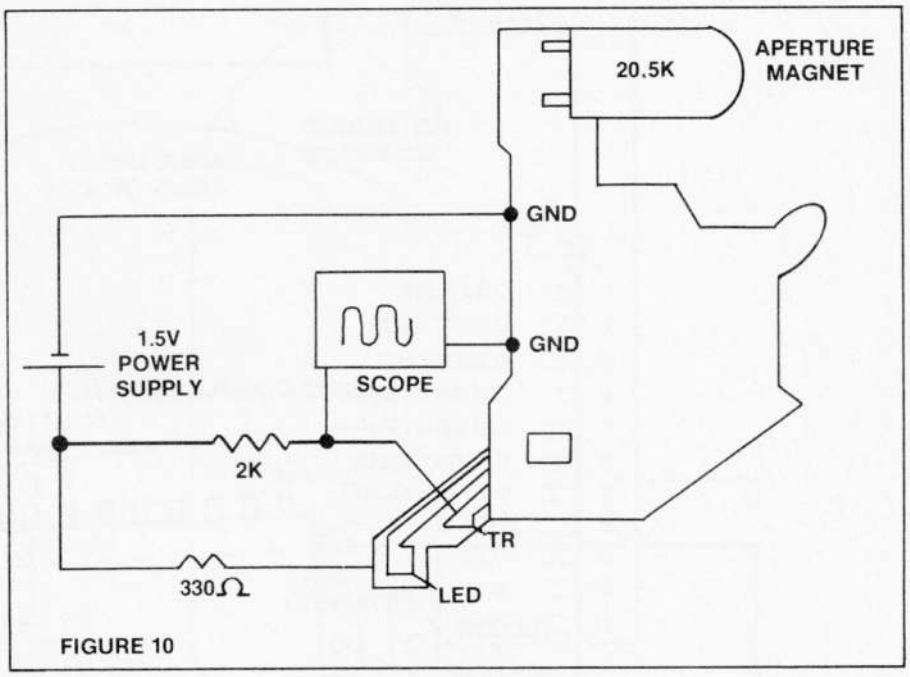


FIGURE 10

5. remove the mirror-box screw in the lower wind-side corner
6. remove remaining 3 mirror-box screws
7. separate mirror box from front plate

Reassembly highlights:

1. Note that there are two different sizes for the mirror-box screws. The larger screws (2mm) go to the top.
2. When you replace the diaphragm-control block, make sure the forked coupling arm straddles the pin on the aperture lever, Fig. 8. Also note that the tab on the aperture-magnet reset lever, Fig. 8, sits above the pin on the mirror-return link. As the mirror returns, the link pushes the reset lever against the aperture-magnet pawl. The pawl then moves out of engagement with the ratchet gear, and the armature moves against the aperture-magnet core.

Other disassembly notes:

1. You can remove the release-magnet block (2 screws — 1 also holds wire clamp) without removing the mirror box or the flex circuit. On reassembly, adjust the position of the release-magnet block for a 0.2 - 0.3mm space gap between the release lever on the release-magnet block and the hook lever on the mirror box (mirror charged), Fig. 8.
2. The transport disassembly is the same as in the ME models. However, the Program Plus has timing marks on the sprocket gear, 2nd gear, and main gear. The sprocket will be properly timed if you align the timing marks on reassembly.

TROUBLESHOOTING:

Behavior without batteries: shutter won't release

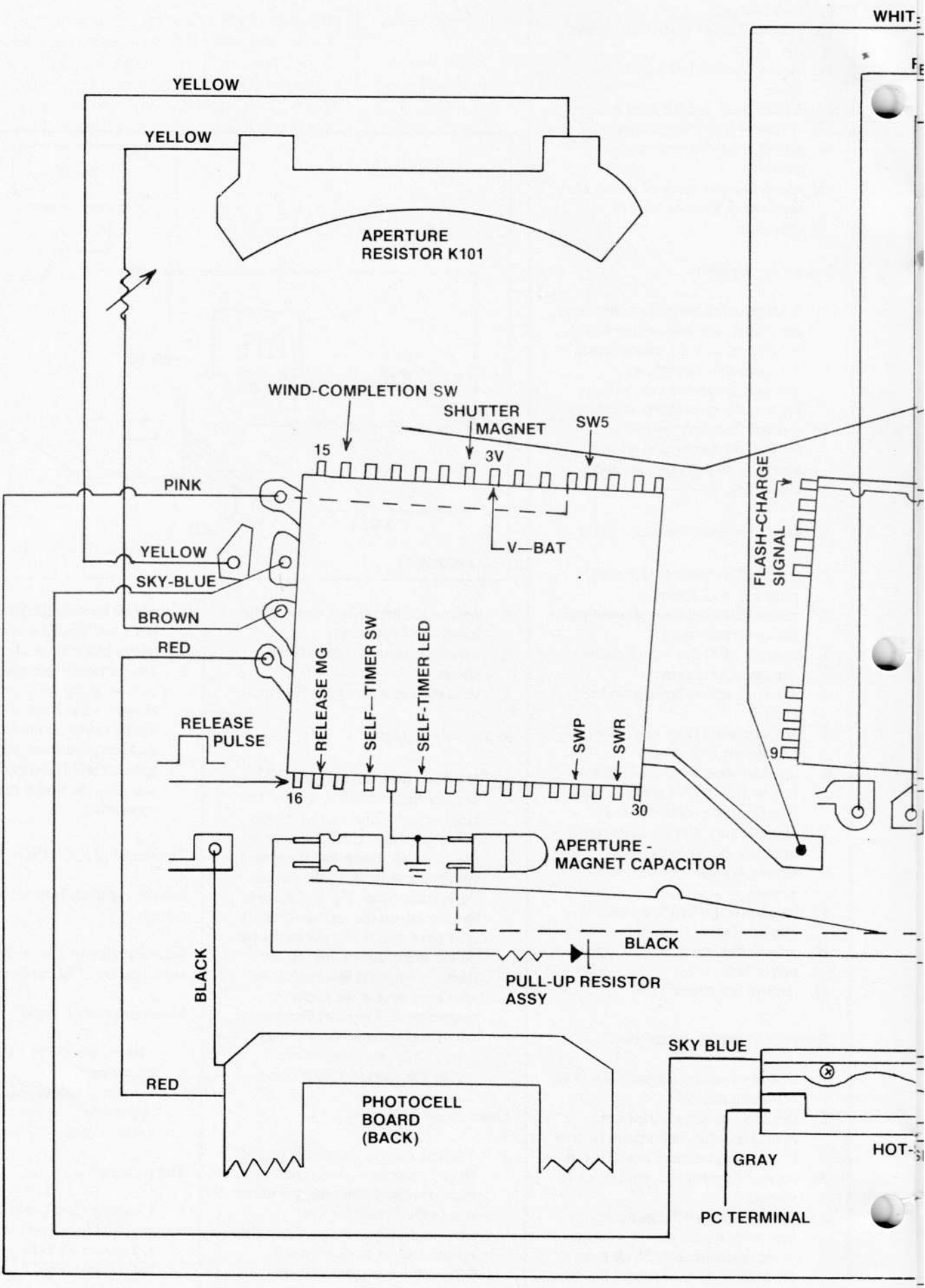
Behavior without lens: no f/stop indication on LCD, no P indication

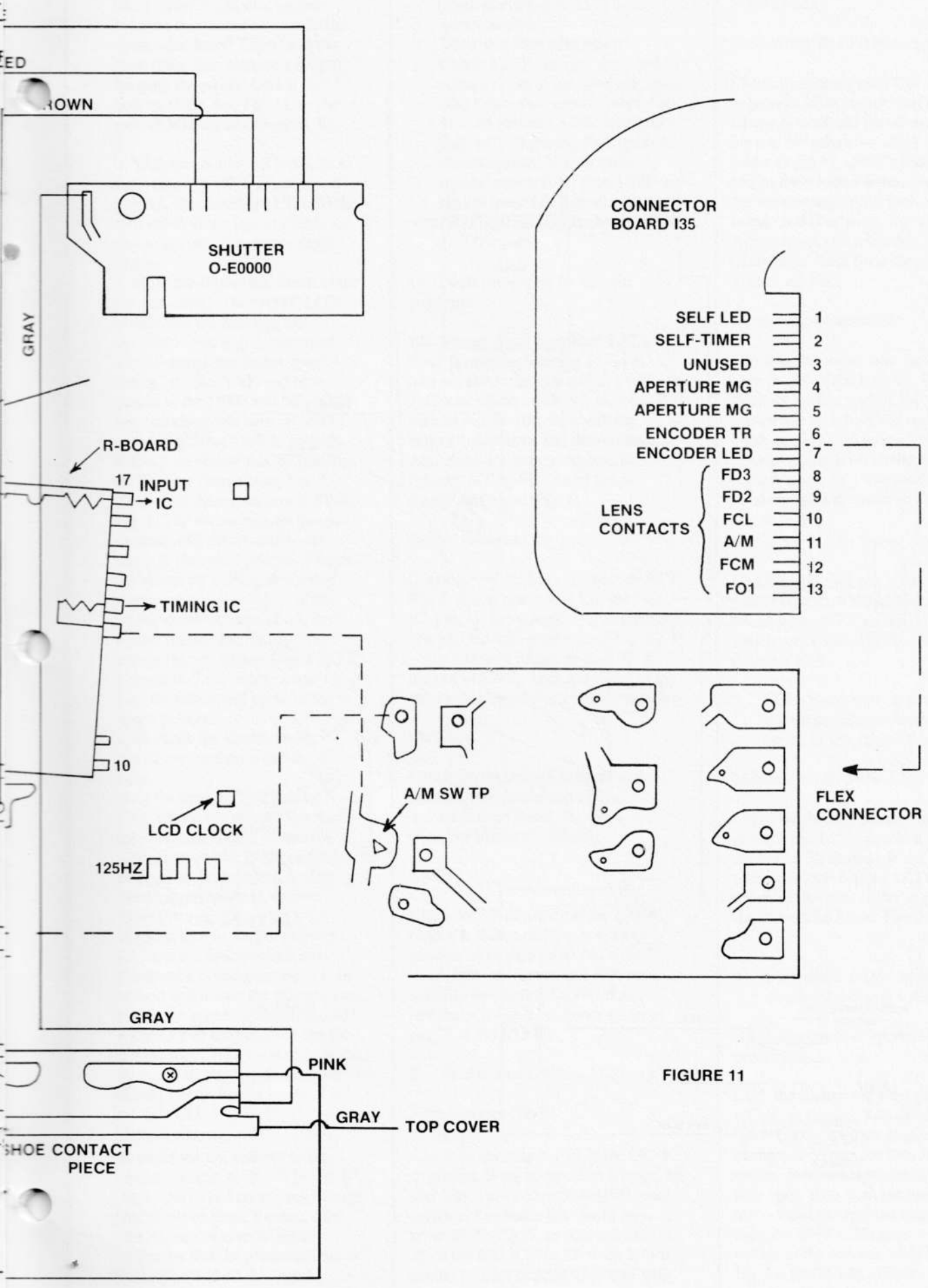
Maximum current draw:

- resting (oscillator + leakage) — 10 microamps
- metering (release partially depressed) — 10ma
- shutter open — 25ma

Test procedures:

1. Checking circuit, mirror box removed from body casting:
   a. Connect 3V between the + battery land, Fig 12, and ground


WHIT
YELLOW
YELLOW
APERTURE
RESISTOR K101
WIND-COMPLETION SW
SHUTTER
MAGNET
SW5
15
3V
PINK
V—BAT
YELLOW
SKY-BLUE
BROWN
RED
RELEASE MG
SELF—TIMER SW
SELF-TIMER LED
SWP
SWR
RELEASE
PULSE
16
30
FLASH-CHARGE
SIGNAL
9
APERTURE -
MAGNET CAPACITOR
BLACK
BLACK
PULL-UP RESISTOR
ASSY
SKY BLUE
RED
PHOTOCELL
BOARD
(BACK)
GRAY
HOT-
PC TERMINAL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SHUTTER
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TIMING IC
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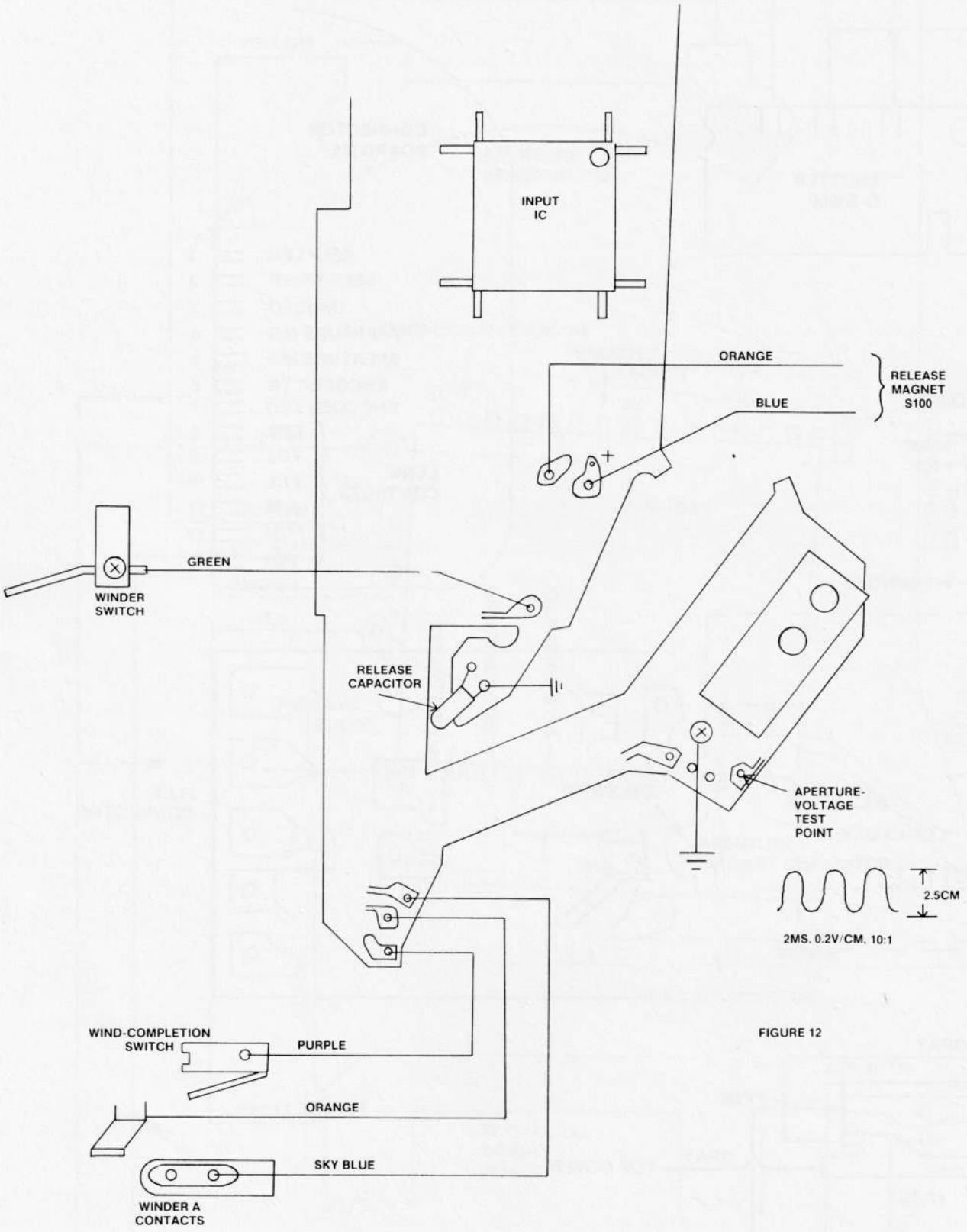
SELF-TIMER 2
UNUSED 3
APERTURE MG 4
APERTURE MG 5
ENCODER TR 6
ENCODER LED 7
LENS CONTACTS
FD3 8
FD2 9
FCL 10
A/M 11
FCM 12
FO1 13
FLEX
CONNECTOR
GRAY
PINK
GRAY
TOP COVER
SHOE CONTACT
PIECE

FIGURE 11


INPUT
IC
ORANGE
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MAGNET
S100
GREEN
WINDER
SWITCH
RELEASE
CAPACITOR
APERTURE-
VOLTAGE
TEST
POINT
2.5CM
2MS. 0.2V/CM. 10:1
WIND-COMPLETION
SWITCH
PURPLE
ORANGE
SKY BLUE
WINDER A
CONTACTS

FIGURE 12

(front plate). Connect a jumper between the ground contact on the shutter-dial board, Fig. 1, and the front plate. Also connect a jumper between the ground land at the bottom of the flex, Fig. 12, or the ground MD-contact terminal, Fig. 2.

b. With the shutter-dial brush set to auto, short the SWS tab, Fig. 1, to ground. The metering LCDs should turn on. With no lens installed, you should get only the shutter-speed display.

c. Move the shutter-dial brush to the manual setting. The "1000" LCD should turn on. Shorting the up/down keys, Fig. 8, to ground should change the shutter-speed setting. At the "100" and bulb positions, the "100" and "B" LCDs respectively should turn on (even without shorting SWS to ground).

d. Cock the mirror box by pushing forward the charge lever, Fig. 7. Then close the release switch SWR, Fig. 1. The release magnet should separate, and the mirror should move to the raised position. Return the mirror by pushing down the mirror-return lever, Fig. 6. If the mirror doesn't release, check the release magnet by shorting the orange release-magnet wire, Fig. 12, to ground. If the release magnet is o.k., the mirror will move to the raised position.

e. To check the shutter-timing circuit, set the shutter-dial brush to auto.

Note the shutter-speed reading. Then release the mirror. The shutter-speed reading should remain for approximately the length of time noted. The shutter-speed reading should then change to a slower speed (because the mirror is up, blocking light to the photodiodes). Or short the timing-switch land (white-wire connection, Fig. 11) to ground and release the mirror. Now the shutter-speed indication should remain for as long as you keep the land shorted. When you remove the short, the shutter-speed indication should remain for the length of time on the LCD.

2. Optical encoder

Connect the test resistors to the optical encoder as shown in Fig. 10. Move the forked connecting arm up and down to rotate the disc. You should see a sine-wave signal, indicating that the phototransistor is turning on and off. No signal indicates a defective LED or phototransistor.

3. Dedicated-flash changeover

Connect 2.4V between the hot-shoe contact closer to the wind side (pink wire to hot-shoe contact piece, Fig. 11) and ground (-). The electronic-flash LCD (lightning-flash symbol) should appear. At auto and at manual speeds faster than 1/60, the shutter-speed LCD should change to "100" and the shutter should deliver 1/100 second.

Troubleshooting steps for specific problems:

1. Shutter won't release, no LCDs

Note: If only the metering LCDs fail to turn on, check the lock switch SWP, Fig. 1. If none of the LCDs will turn on (P, manual speeds, 100, B), check the battery connections and the oscillator. Also check for loose ground screws (bottom of flex, Fig. 2, and top of shutter-dial board, Fig. 1).

Battery voltage to flex

Check for 3V at the pin contact of SWP, Fig. 1, and at pins 6 and 8 of the I/O IC, Fig. 11. No voltage — check battery box and red-wire connections, Fig. 12. If you get battery voltage to the I/O IC, but not to SWP, check the solder to the shutter-dial board, Fig. 9 (terminal #1).

Oscillator

Check for the sine-wave signal at the quartz crystal (under top of flex, accessible from back). No signal — crystal or timing IC defective.

SWP

Check for 3V at pin 27 of the I/O IC (with the shutter-dial brush at any position other than lock). No voltage — check for poor contact in SWP, poor solder to the shutter-dial board at terminal #3, Fig. 9, and poor solder at pin 27 of the I/O IC.

2. Shutter won't release, LCDs o.k.

Release switch SWR

Check by shorting pin 29 of the I/O IC to ground. If the shutter then releases, the problem is poor contact in SWR, poor solder to the shutter-dial board at terminal #9, Fig. 9, or poor solder at pin 29 of the I/O IC. Pin 29 of the I/O IC should connect directly to ground with SWR closed.

Release magnet or release capacitor

Check by shorting pin 17 of the I/O IC to ground. If the mirror then releases, the release magnet and the release capacitor are o.k. No release — check for poor solder to pin 17, to the release capacitor, and to the release magnet, Fig. 12. Check the release-magnet coil between the orange and blue wires, Fig. 12. Approximate coil resistance — 12.7 ohms. Also check for a dirty release-magnet interface.

Wind-completion switch

Check at the purple wire, bottom of flex, or at pin 14 of the I/O, IC, Fig. 11. With the shutter cocked, the wind-completion switch should open and break continuity to ground. If pin 14 remains at ground with the shutter cocked, check for a constantly closed wind-completion switch or a pinched purple wire.

I/O IC

Check by shorting pin 16 to positive battery (pin 8). If the mirror then releases, the I/O IC is o.k. The problem may be poor solder at pin 16 or a defective ICA.

3. LCDs won't turn on with the release partially depressed, but turn on when you release the shutter

Metering switch SWS

Check by shorting pin 4 of the I/O IC to ground. The LCDs should turn on and remain on 30 seconds. If not, the I/O IC may be defective. If the LCDs do turn on, check for poor solder at pin 4 and at the shutter-dial board, Fig. 9 (terminal #10).

4. Diaphragm always stops down fully on auto diaphragm setting

Aperture magnet or aperture-magnet capacitor

Cock the shutter and short pin 11 of the I/O IC to ground. You should hear a "click" as the aperture magnet disengages. When you then release the shutter, the diaphragm should remain fully open. If so, both the aperture magnet and the aperture-magnet capacitor are o.k. No click — check the voltage at the aperture-magnet capacitor, Fig. 11; you should measure 3V at the

lead closer to the back of the camera. A very low voltage may indicate a defective aperture-magnet capacitor. Voltage o.k. but no click — poor contact in flex connector, defective aperture magnet, Fig. 6, or poor solder to aperture magnet.

Optical encoder

Check for poor contact in the flex connector. To check the optical encoder, see "Test Procedures," #2.

A/M Switch

If the P letter won't turn on with the lens set to auto, short the A/M test point, Fig. 11, to ground. The P letter should turn on. If not, check for poor solder at the R-board, Fig. 11 (pin 6). If the P letter does turn on when you short the test point to ground — but not with the lens at auto — check for poor contact between the A/M pin and the lens and for poor contact in the flex connector. If the LCD reads properly, but the exposure is incorrect at program, check the pull-up resistor assembly (see, "Revised Sections").

5. Shutter delivers fastest speed only

Shutter magnet

Short the brown shutter wire, Fig. 11, to ground and release the shutter. The shutter should stay open. If not, the shutter magnet is defective or dirty.

ICA, I/O IC

Check the solder at the I/O IC (pins 9, 10, 28). When you release the shutter, the signal at pin 10 should pulse high (2V). If not, ICA may be defective. If the pin 10 signal does pulse high, but the shutter still won't set slower speeds, the I/O IC may be defective.

6. Shutter releases immediately after cocking

Release switch SWR, constantly closed

Check at pin 29 of the I/O IC. You should have continuity to ground only when you close SWR.

Release magnet, out of adjustment or not holding armature

Check for a 0.2 — 0.3mm space gap between the release lever on the magnet assembly and the hook lever on the mirror box, Fig. 8. If the space gap is insufficient, loosen the two screws and shift the release magnet to increase the distance. If the release magnet won't hold the armature, clean the magnet interface or replace the release-magnet block.

7. No self-timer delay

Note: Short pin 19 of the I/O IC to ground and release the shutter — the circuit should deliver the self-timer delay. If so, the circuit is o.k. Check the solder at pin 19, the flex connector, and the self-timer switch.

Self-timer switch

Disconnet the flex connector, Fig. 4. With the self-timer switch in the on position, check for direct continuity between the switch land (terminal #2, Fig. 11) and ground. No continuity — self-timer switch, not making contact. If you do measure continuity, the problem may be poor contact in the flex connector.

8. LCD always shows underexposure indication ("1000" and minimum-aperture LCDs flickering), diaphragm remains fully open on program

AV resistor or AV-adjustment resistor, poor contact or open

Short between the yellow and brown wires at the front top of the flex. If the flickering indication then stops, check the AV brush contact and the AV-adjustment resistor.

9. LCD always shows P indication in program mode (even with lens at manual f/stop), error indication on manual

A/M switch

Check for a short between the A/M test point on the flex connector, Fig. 11, and ground. The diode of the pull-up resistor assembly may be touching the aperture-magnet capacitor, Fig. 11.

10. Battery drain

If the camera draws excessive leakage current (over 10 microamps), remove the top cover and recheck the current draw. If o.k., the problem is probably that the insulation seal inside the top cover has shifted out of position. If the camera still draws excessive current, check for a short between pins of the timing IC (top, underside of flex, wind side).

11. Shutter won't stay open at bulb

Note: With the top cover removed, the shutter may fail to stay open at bulb — even though the LCD shows "B." The top cover holds down the shutter-dial brush to provide good contact with the shutter-dial board. Lightly push down the brush to provide better contact. If the shutter still won't stay open on bulb, check for poor brush contact and poor solder to the shutter-dial board (terminals 4 and 5, Fig. 9).

REVISED SECTIONS:

1. Flex T100 and shutter-dial board 1000. The old-style shutter-dial board has an IC on the underside. The T100 circuit and the shutter-dial board have been revised to eliminate the IC. You can identify the new-style T100 circuit by the yellowish moisture-proofing silicone on top, Fig. 1. The new-style T100 (complete with the new-style shutter-dial board) will interchange with the old style. However, if you replace just the shutter-dial board, match it to the T100 flex.

   - old-style shutter-dial board (with IC) — 0-I000

   - new-style shutter-dial board (no IC) —1-I000

   - new-style flex circuit — PC board T100+1-I000 (the old style is no longer supplied)

2. Counter-switch contact pin on shutter-dial board. The old style is nickel-plated. The new style is gold-plated to improve the contact. If you have a problem with poor contact in the counter switch (LCD does not read "1000" with the back closed and the counter at the start position), you can revise the contact without replacing the shutter-dial board. Pentax supplies a gold-plated spring I18-50. The spring fits over the counter-switch contact pin; the end of the spring then hooks against the side of the shutter-dial board. By notching the side of the shutter-dial board, you can solder the end of the spring directly to the contact path for the counter-switch pin.

3. Pull-up resistor assembly, Fig. 11, added to improve A/M switching.

If the LCD reads properly, but the exposures are incorrect or erratic on program, add the resistor/diode assembly O-T150-50 between the capacitor and the A/M test point as shown in Fig. 11.

OTHER COMMENTS:

1. Product number for parts orders — 24503 (the Program A, exactly the same camera except for the top cover, is 24502).

2. The flex circuit is available only as a complete unit, including the shutter-dial board and photocell board. The motor-drive contacts (rewind side, bottom) and the mirror for the LCD are not included on the replacement flex. However, the flex does include double-sided tape for attaching the mirror below the LCD. Use the motor-drive contacts and the mirror from the old flex. See "Revised Sections" — #1.

3. Mechanical parts (except for the shutter block) will interchange with the Super Program. Other part numbers:

   - self-timer LED window — A113
   - connector board — 135-01
   - f-volume resistor — K101-01
   - self-timer PC board — A114
   - diaphragm-control block (optical encoder, aperture magnet) — G100
   - battery case — 0-A11