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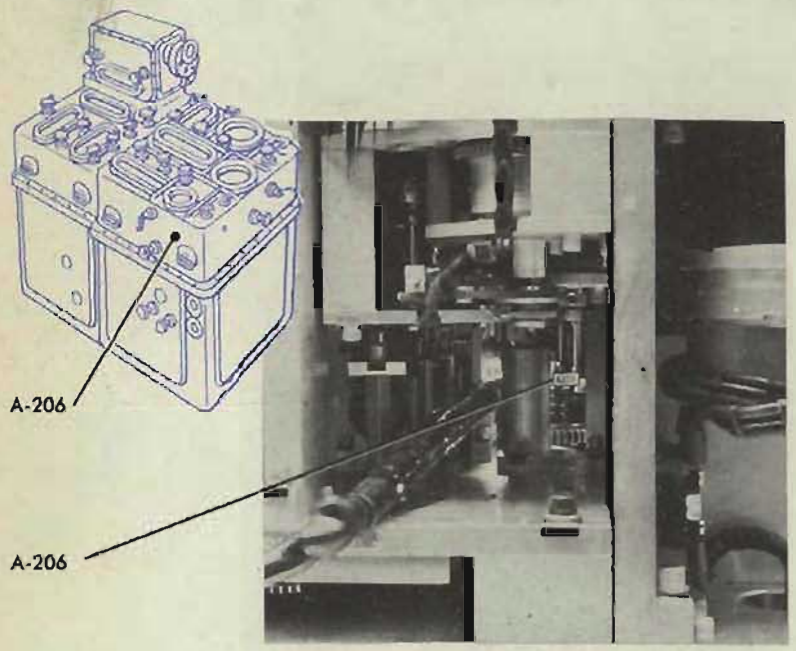
A-206 VECTOR SOLVER FRICTION DRIVE



Location

A-206 is located under cover 1, at the front of the vector solver.

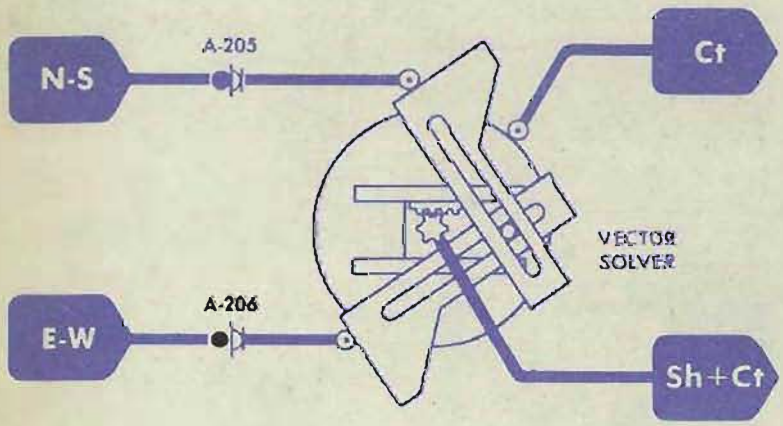
Check

This friction should be tight enough to allow the E-W line to drive the E-W rack and position the vector solver during rate control. It should slip, however, when *Sh* or *Ct* is introduced manually.

Adjustment

Loosen A-205 and turn the threaded clamp until it barely touches the washer below it. Then turn the clamp clockwise 3½ turns, thereby compressing the spring.

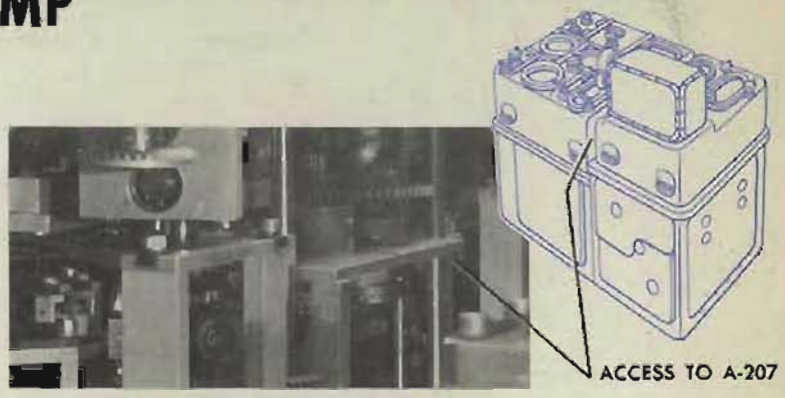
Tighten the screw, and recheck.



Note

The friction loads on A-206 and A-205 should be equal.

A-207 ASSEMBLY CLAMP

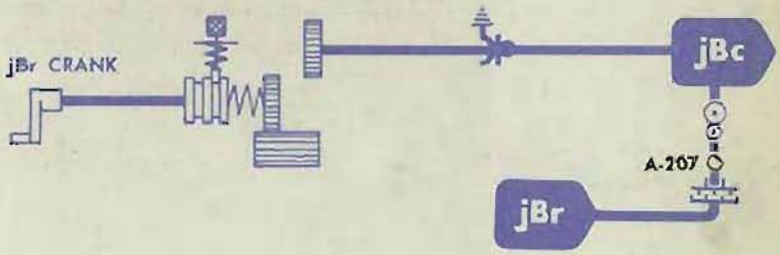


Location

A-207 is under cover 1 at the rear, on the spur gear of the *jBr* clutch.

Check

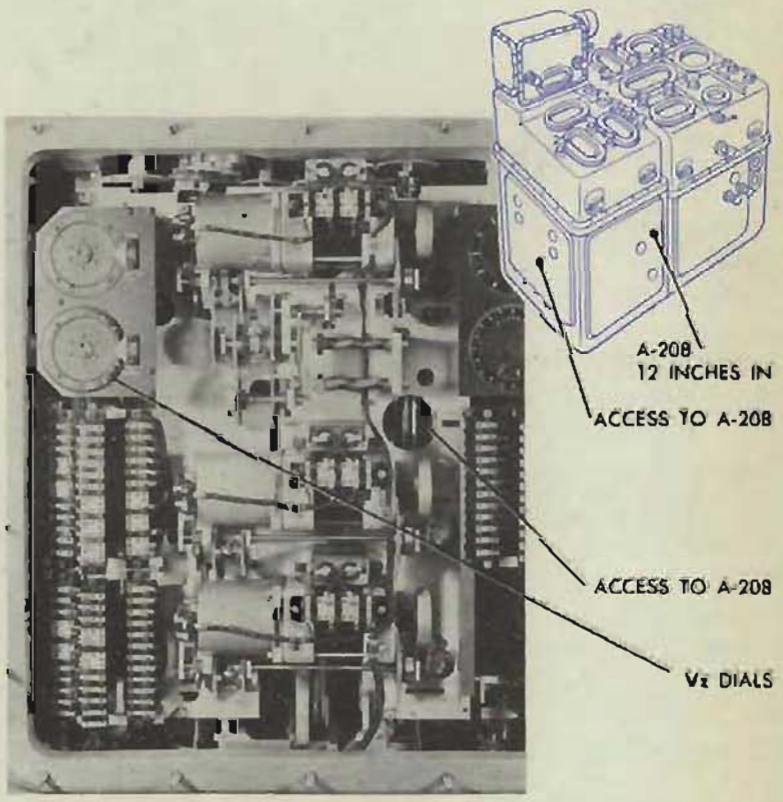
A-207 should be tight.



Adjustment

Tighten A-207. No further adjustment is necessary.

A-208 Zd·Ds MULTIPLIER to Ds COUNTER



Location

A-208 is under cover 8. It can be reached through the access hole above the damper of the *jB'r* follow-up, under cover 7.

Older instruments do not have this access. On these computers, A-208 may be adjusted with a geared screw driver inserted under cover 8.

Check

Turn the power ON.

Set *Ds* at 500 mils.
Set *Vs* at 2000'.
Set *L* at 2000'.
Set *E* at 0 ' with the sync *E* handcrank at CENTER.
Match the sync *E* dials at the fixed index with the handcrank OUT.

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Full travel of *Zd* should cause no motion of the output rack of the *Zd·Ds* multiplier.

Motion of the *Zd·Ds* output rack can be observed on the *Vz* dials. The dials should not move for full travel of *Zd*.

Adjustment

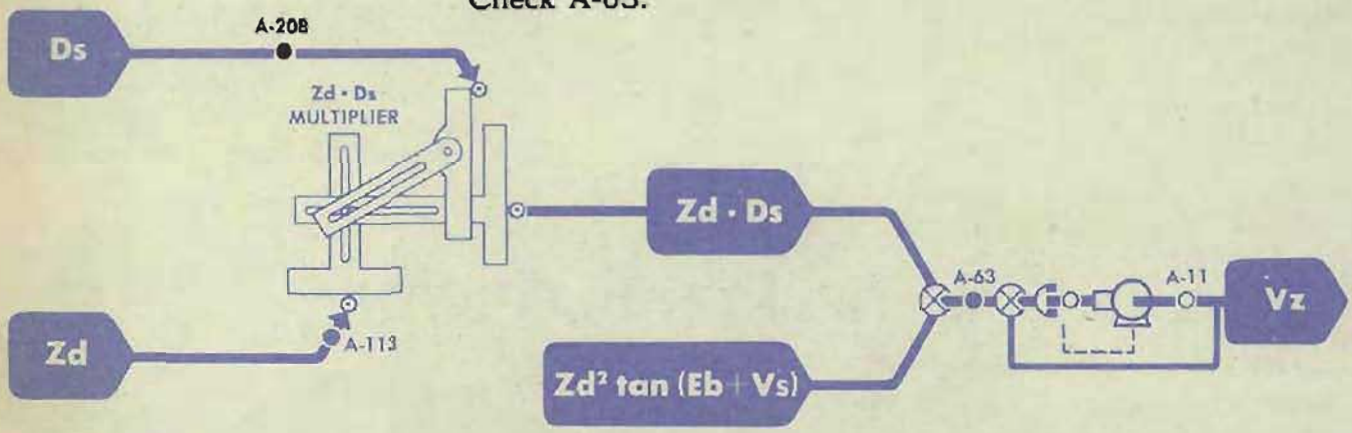
If the *Vz* dials move, make A-208 slip-tight.

CAUTION

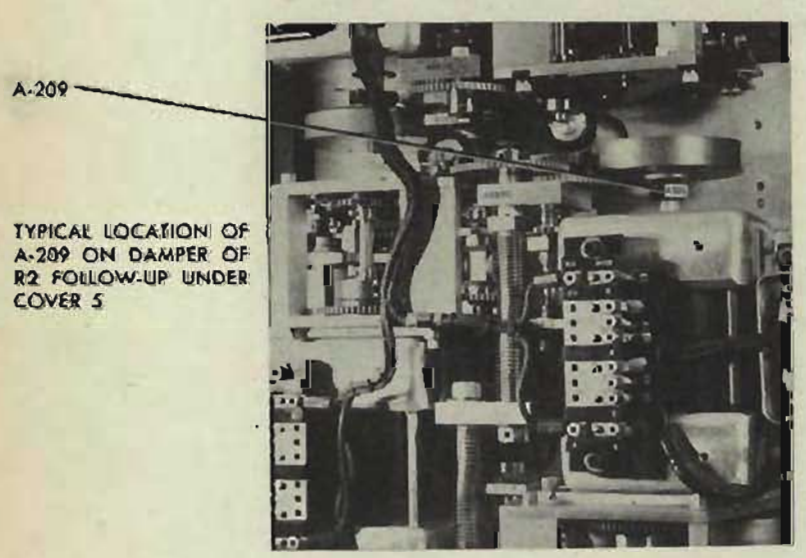
While making A-208 slip-tight, hold the *Ds* input rack to prevent its falling and causing damage.

Offset *Ds* to locate the zero position of the *Ds* input rack. When there is no motion of the *Vz* dials for full travel of *Zd*, hold the small spur gear on the same shaft as A-208, and bring the *Ds* counter back to 500 mils with the handcrank.

Tighten A-208, and recheck.
Check A-63.



A-209 ASSEMBLY CLAMPS



TYPICAL LOCATION OF A-209 ON DAMPER OF R2 FOLLOW-UP UNDER COVER 5

Location

A-209 is the assembly clamp that holds each magnetic damper to its associated servo shaft. There is a magnetic damper and a clamp A-209 on each of the following servo motor shafts:

Under cover 1: *RdE, dRh, RdBs, dR, Sh, Ct, jdR, jE, jBr*

Under cover 3: *WrD + KRdBs*

Under cover 4: *F, Tf, Vf + Pe, Tf/R2*

Under cover 5: *Ywgr, R2, V, Dtwj, Co*

Under cover 6: *Eb, Eb* booster

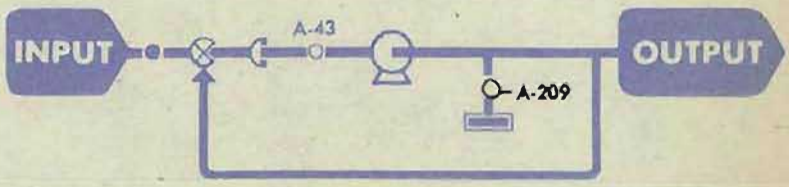
Under cover 7: *Dd, Vz, jB'r, B'r* local control

Under cover 8: *B'r* receiver

A-209 is also located on the large damper on the bearing filter under cover 3.

Check

If A-209 is loose, the damping action of the damper is lacking, and the damper may slip along the shaft to cause interference with other assemblies. A follow-up with a loose damper may oscillate or come to a slow stop, after wandering back and forth past the synchronizing point. Check that A-209 is tight and the damper is located so that it causes no interference with any part of the mechanism.



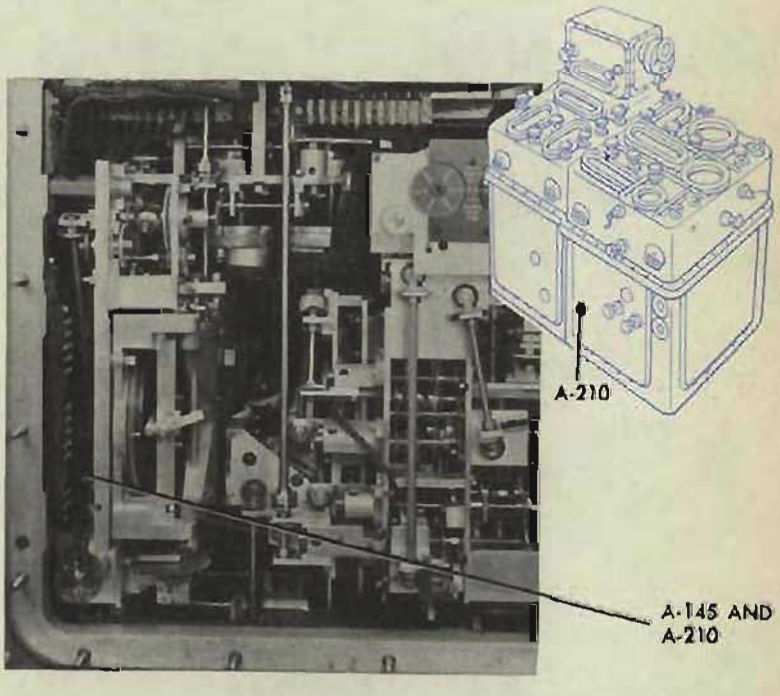
Adjustment

Tighten A-209.

A-210 SECANT E CAM to E DIALS

Location

A-210 is under cover 3, behind the integrator mounting plate. A-210 is on computers with Ser. Nos. 389 and lower. It is replaced by A-146 on Ser. Nos. 390 and higher.

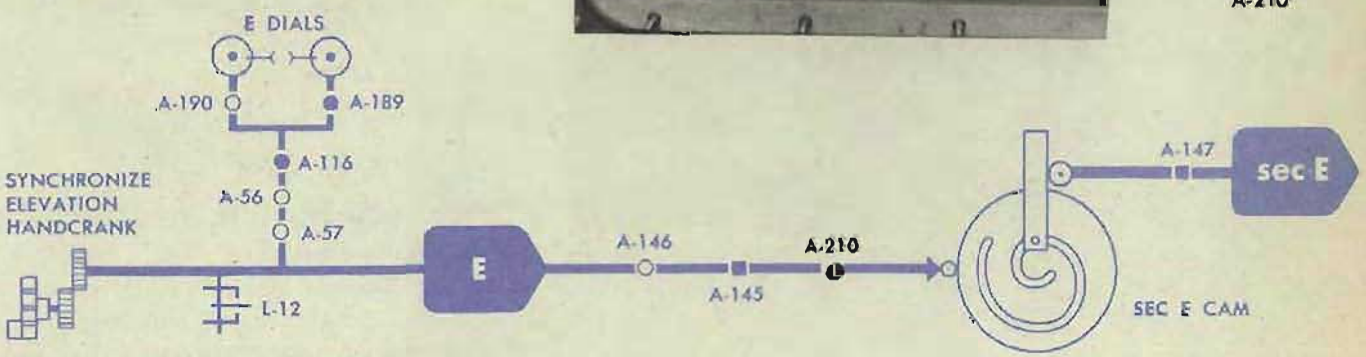


Check

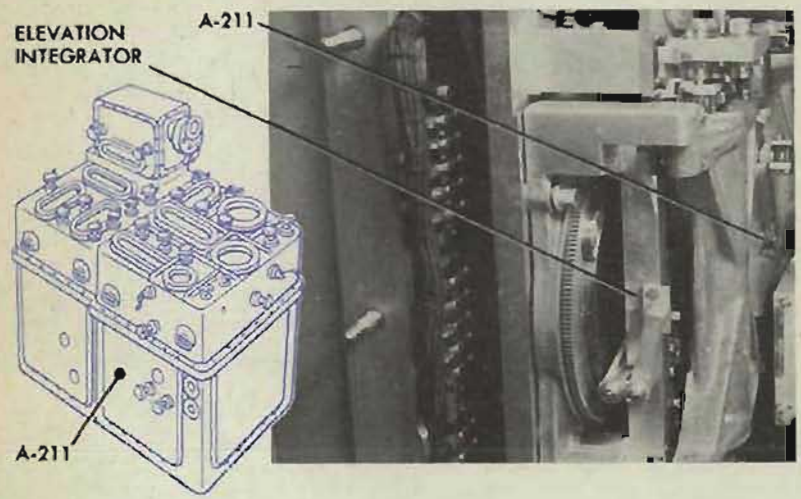
Check that A-210 is tight, and A-145 is in adjustment.

Adjustment

Follow the readjustment procedure for A-146.
Tighten A-210, and readjust A-145.



A-211 ASSEMBLY CLAMP



Location

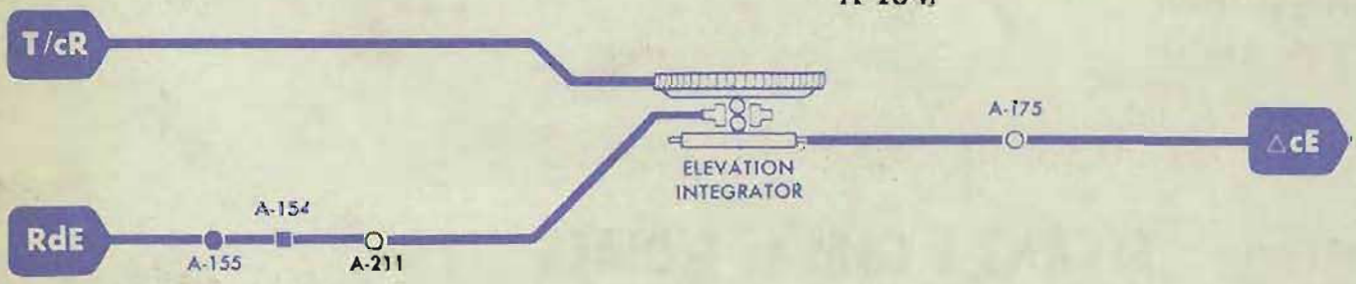
A-211 is under cover 3, on a large spur gear near the elevation integrator.

Check

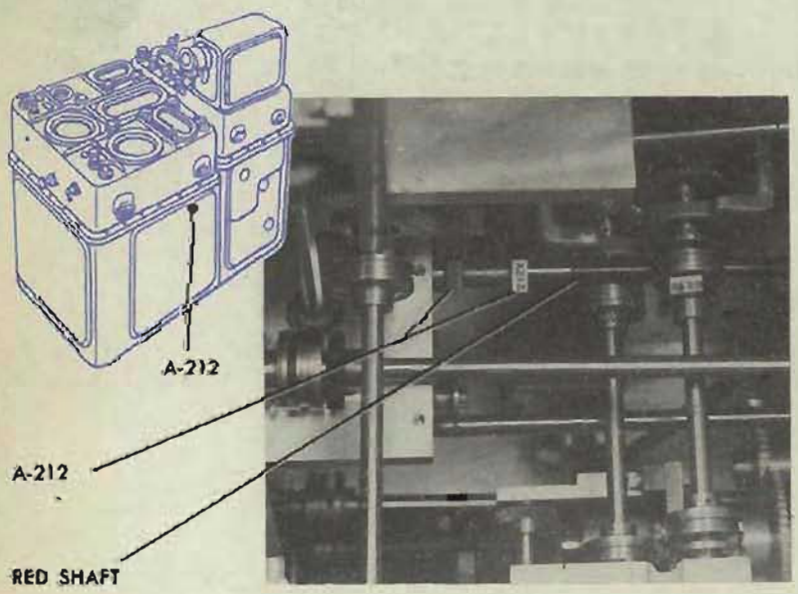
A-211 should be tight enough to prevent the elevation integrator carriage from slipping through the clamp to move off its setting.

Adjustment

Tighten A-211. Readjust A-155 and A-154.



A-212 So DIAL to So RECEIVER



Location

A-212 is under cover 5, about 14 inches in, on the front end of a red shaft.

A-212 is a sleeve coupling with a clamp on either end.

A-212 is omitted on Mod 0.

Check

Turn *So* from limit to limit with the *So* handcrank IN, to make sure that the *So* limit-stop adjustment is not upset.

Shift the *So* handcrank to the OUT position.

Turn the power ON.

Transmit *So* from the pitometer log to the computer.

The *So* dial should read the same value as that being transmitted from the pitometer log.

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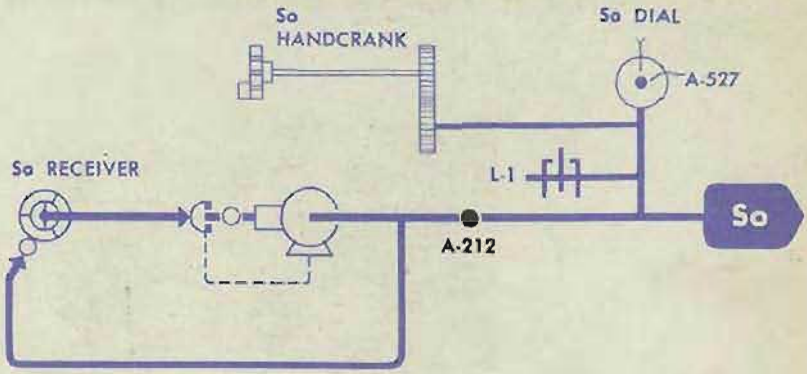
Adjustment

If the *So* dial does not match the pitometer log value, loosen A-212.
Bring the *So* dial to the matching value, with the *So* handcrank IN. Shift the handcrank to the OUT position. The *So* dial should stay at the correct value. If it does not, shift the handcrank to the IN position and correct until it does.

Tighten A-212 and check *So* transmission at two or three different values.



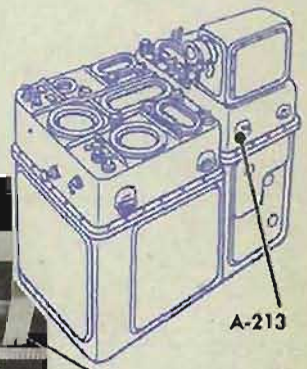
Note

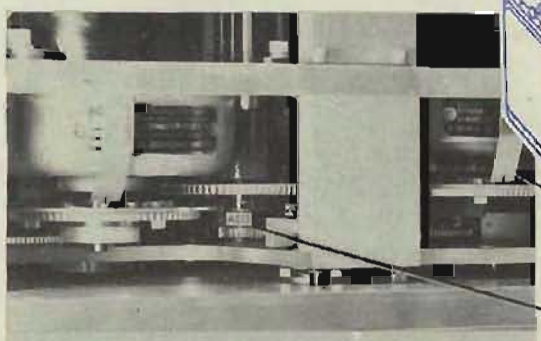
Both clamps A-212 on the sleeve coupling must be tight.

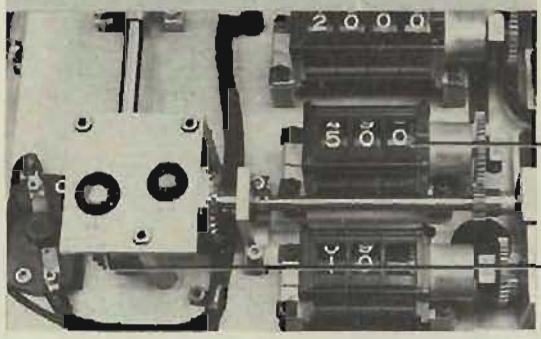
A-213 COARSE to FINE SYNCHRO – Ds DOUBLE-SPEED TRANSMITTER

Location

A-213 is under cover 2.
It is omitted on Mods 0, 2, and 6.







Check

Set the coarse *Ds* synchro at electrical zero, using the *Ds* input gear.

The fine *Ds* synchro should also be at electrical zero.

Both synchros are at electrical zero when the scribe marks on their rotors are matched with the fixed index marks.

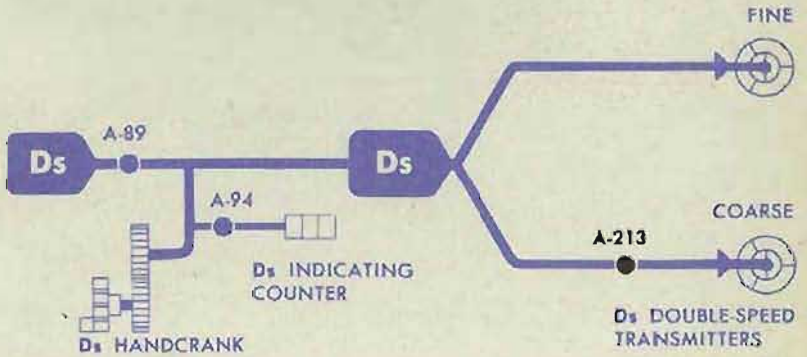
Adjustment

If the fine synchro is not at electrical zero, make A-213 slip-tight.

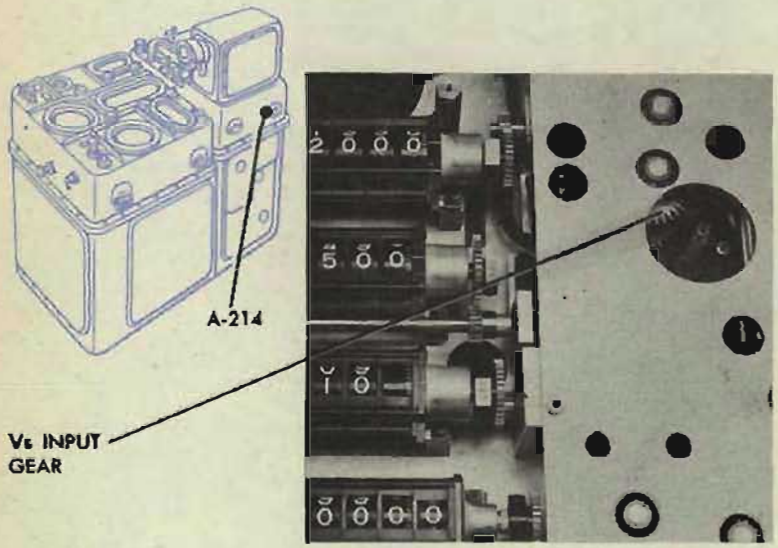
Hold the large gear on the rotor of the coarse synchro.

Turn the *Ds* input gear until the fine synchro is at electrical zero.

Tighten A-213 and recheck.



A-214 COARSE to FINE SYNCHRO — Vs DOUBLE-SPEED TRANSMITTER



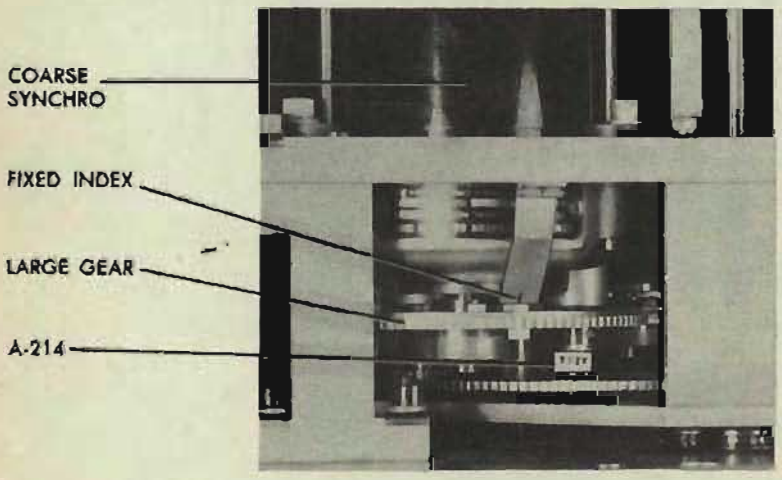
Location

A-214 is under cover 2, below and to the right of the fine *Vs* synchro. A-214 is omitted on Mods 0, 2, and 6.

Check

Set the coarse *Vs* synchro at electrical zero, using the *Vs* input gear.

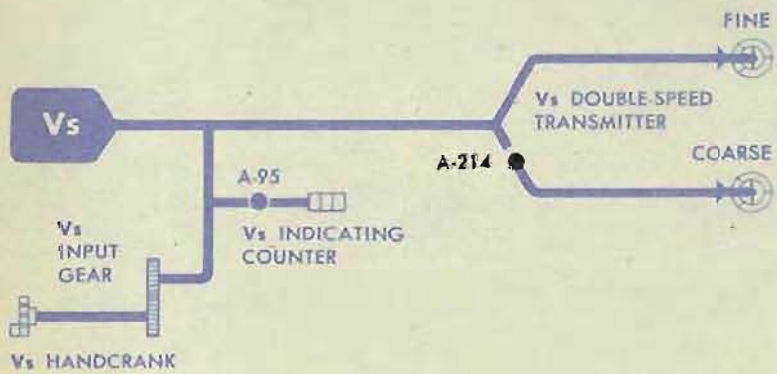
The fine *Vs* synchro should also be at electrical zero. Both synchros are at electrical zero when the scribe marks on their rotors are matched with the fixed index marks.



Adjustment

If the fine synchro is not at electrical zero, make A-214 slip-tight.

Hold the large gear, which meshes with the gear above A-214, to keep the coarse synchro at electrical zero.



Turn the *Vs* input gear until the fine synchro is at electrical zero.

Tighten A-214 and recheck.

A-215 LOST MOTION TAKE-UP SPRING on jDd LINE

Location

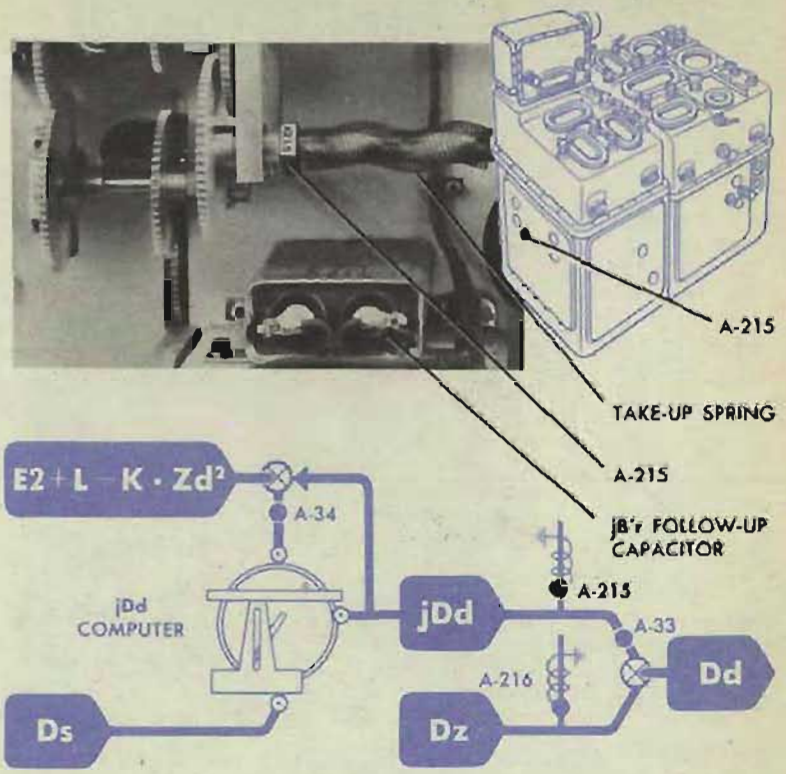
A-215 is under cover 7, above the *jB'r* follow-up capacitor.

Adjustment

Turn the power ON.
Set *Ds* at 500 mils.

Loosen the clamp and allow the spring to unwind.
Wind the spring three revolutions by turning the clamp.

Tighten the screw.
Check A-33.



A-216 LOST MOTION TAKE-UP SPRING on Dz LINE

Location

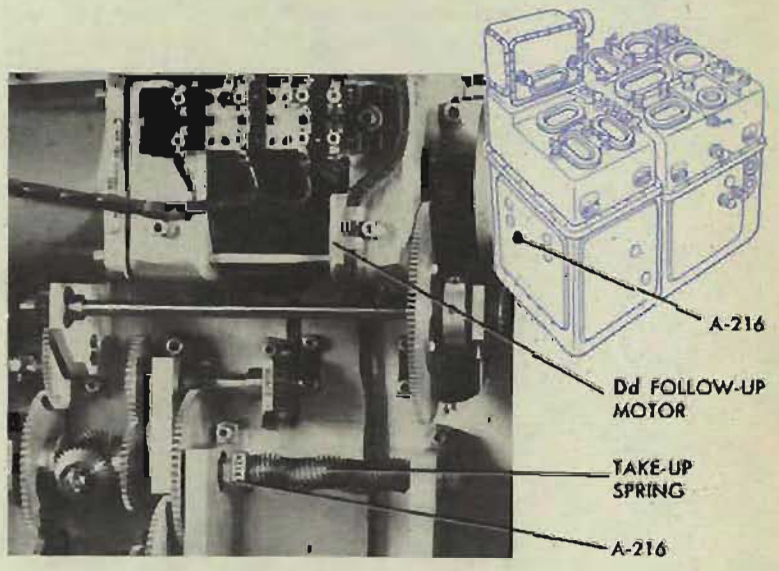
A-216 is under cover 7, at the end of the spring 2 inches below the *Dd* follow-up.

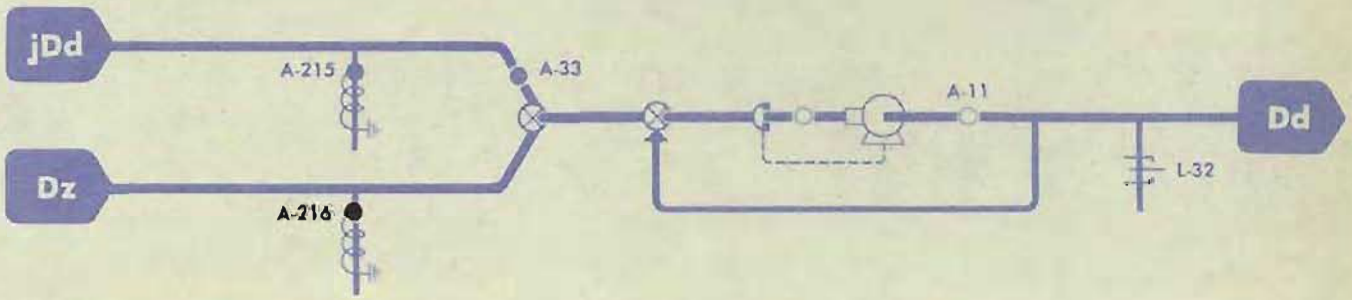
Adjustment

Turn the power ON.
Set *Zd* at 2000'.

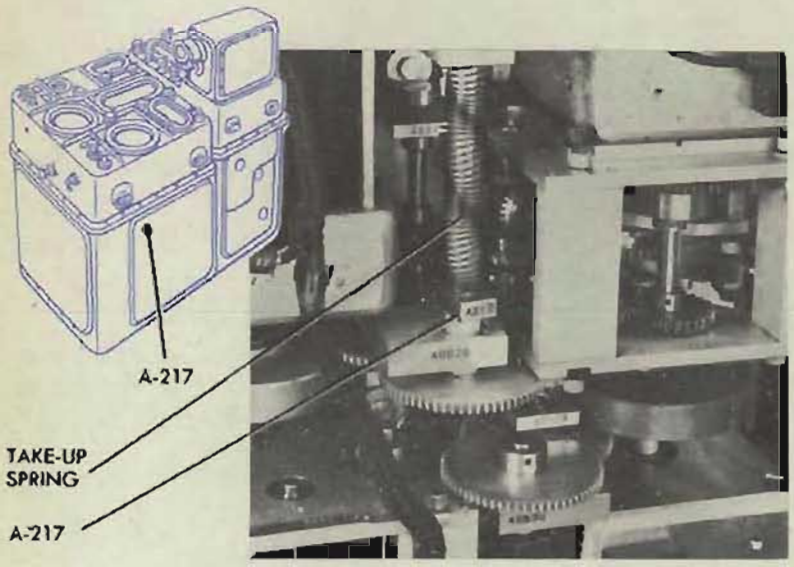
Loosen the clamp and allow the spring to unwind.
Wind the spring three revolutions by turning the clamp.

Tighten the screw.
Check A-33.





A-217 LOST MOTION TAKE-UP SPRING on Dtwj LINE



Location

A-217 is under cover 5.

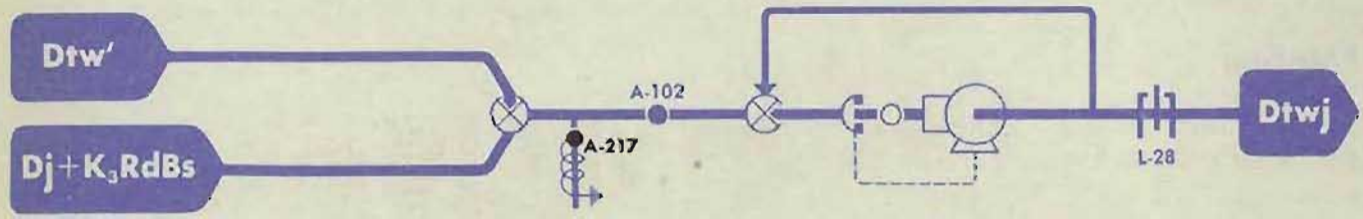
Adjustment

Turn the power ON.
Set *So*, *Sh*, *Sw*, and *Dj* at 0.

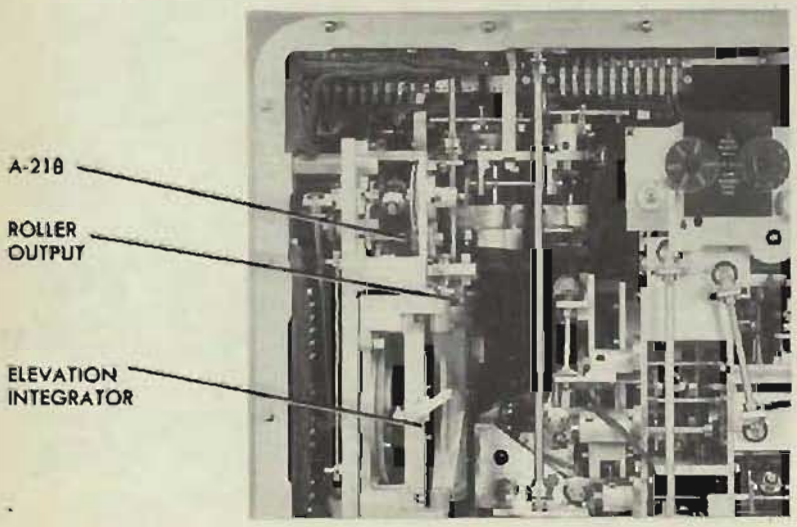
Loosen the clamp and allow the spring to unwind.

Wind the take-up spring three revolutions counterclockwise (looking down) by turning the clamp.

Tighten A-217.
Check A-102.



A-218 ASSEMBLY CLAMP



Location

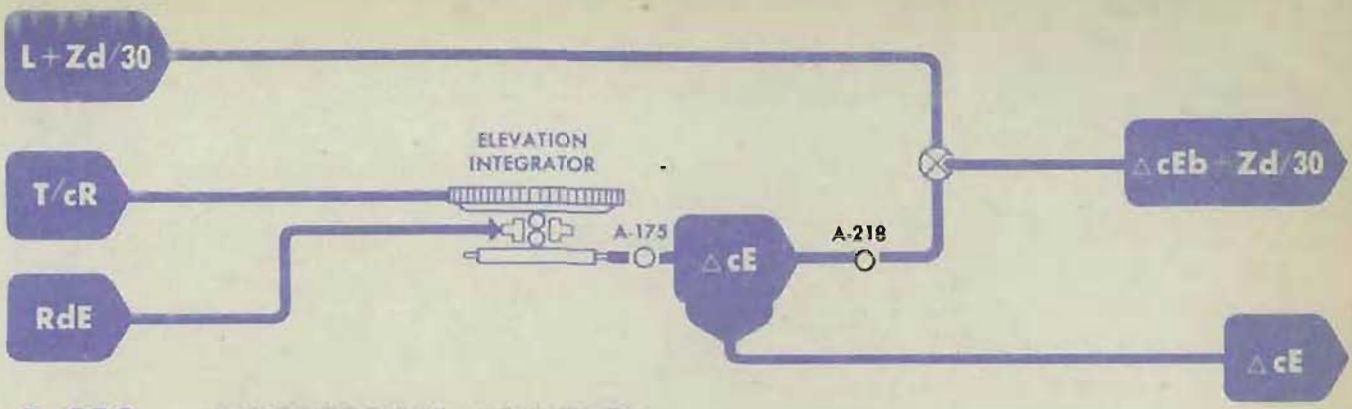
A-218 is under cover 3, on a spur gear in the output gearing of the elevation integrator.
A-218 is omitted on Mod 0.

Check

Check that A-218 is tight.

Adjustment

Tighten A-218.



A-219 ASSEMBLY CLAMP

Location

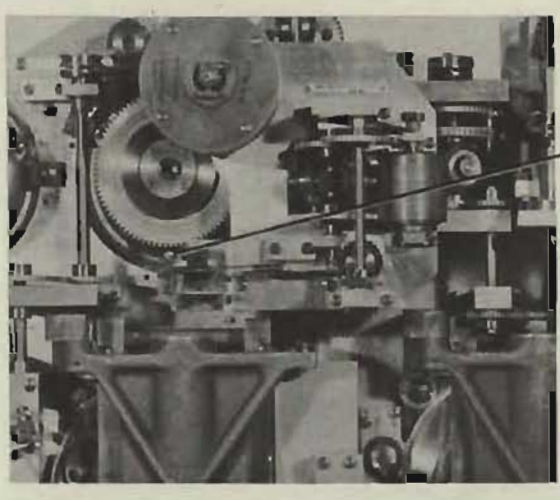
A-219 is under cover 3, above the sec *E* integrator, on the △*cB'r* gearing. A-219 is omitted on Mod 0.

Check

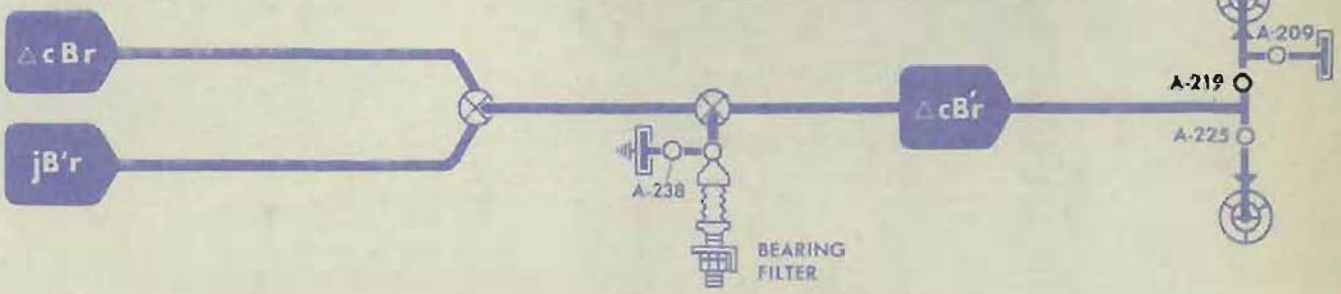
Check that the △*cB'r* auto transmitter rotor gear cannot be turned when the △*cB'r* line is held.

Adjustment

Tighten A-219.



INTEGRATOR GROUP REMOVED FROM THE COMPUTER



A-220 LOST MOTION TAKE-UP SPRING on R2 LINE

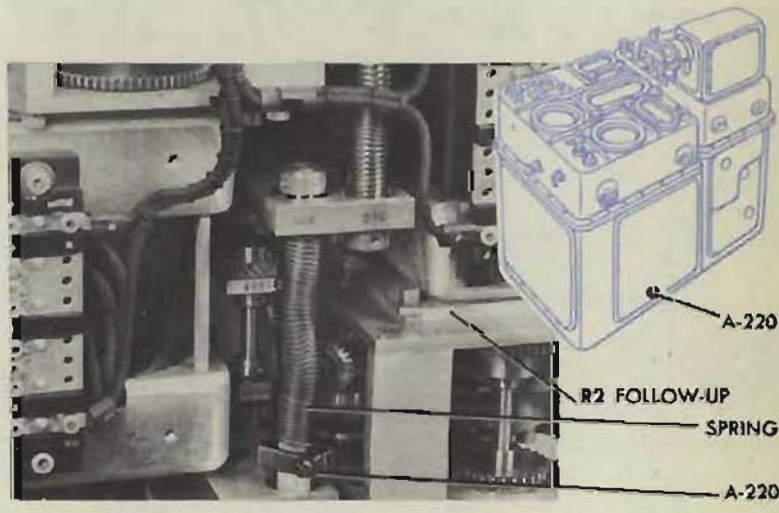
Location

A-220 is under cover 5, in front of the *R2* follow-up control.

Adjustment

Turn the power ON.
Set *So*, *Sh*, *Sw*, and *dH* at 0 knots.
Set *Rj* at 0 yards.
Set *I.V.* at 2550 f.s.
Set *cR* at 2000 yards.

Loosen the clamp and allow the spring to unwind.



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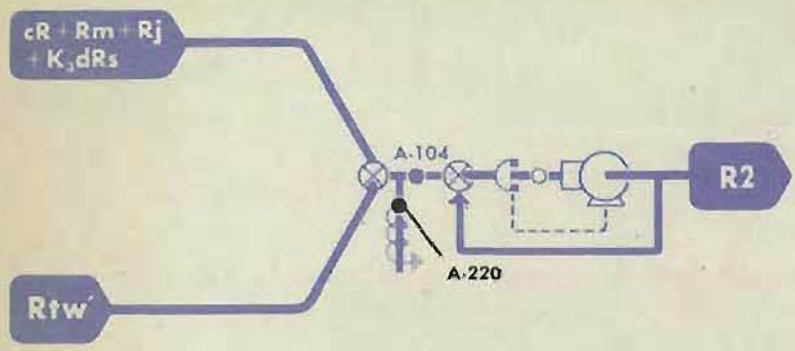
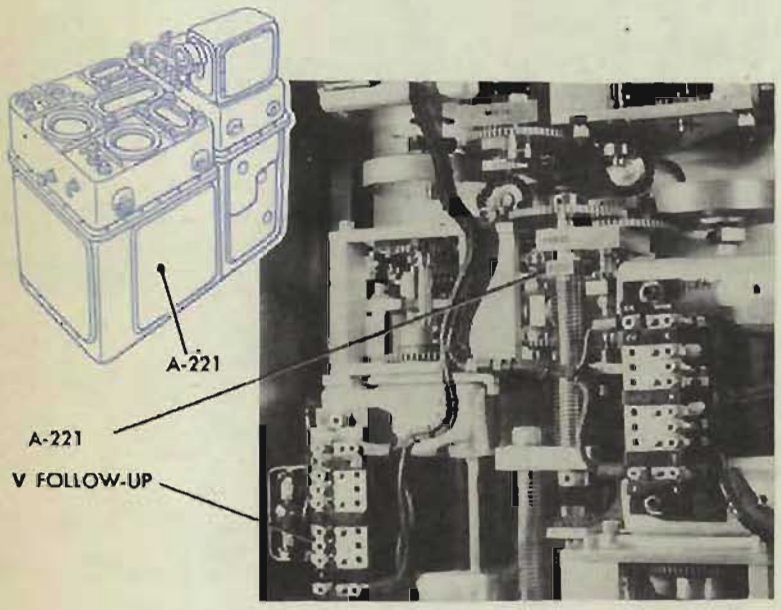


Wind the take-up spring three revolutions counterclockwise (looking down) by turning the clamp.

Tighten the screw.
Check A-104.

A-221 LOST MOTION TAKE-UP SPRING on V LINE



Location

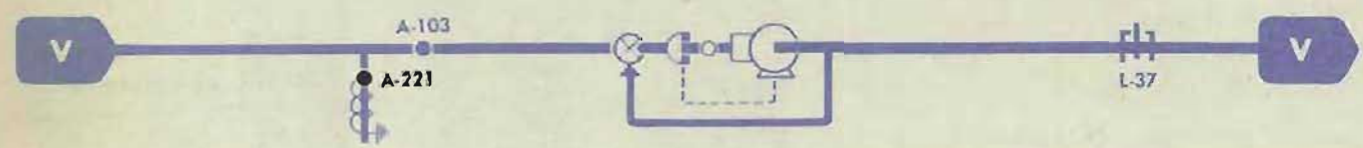
A-221 is under cover 5, at the upper end of the spring near the *V* follow-up.

Adjustment

Turn the power ON.
Set *So*, *Sh*, *Sw*, and *dH* at 0 knots.
Set *Ds* at 500 mils and *Vj* at 0 mils.

Loosen the clamp and allow the spring to unwind.
Wind the take-up spring three revolutions clockwise (looking down) by turning the clamp.

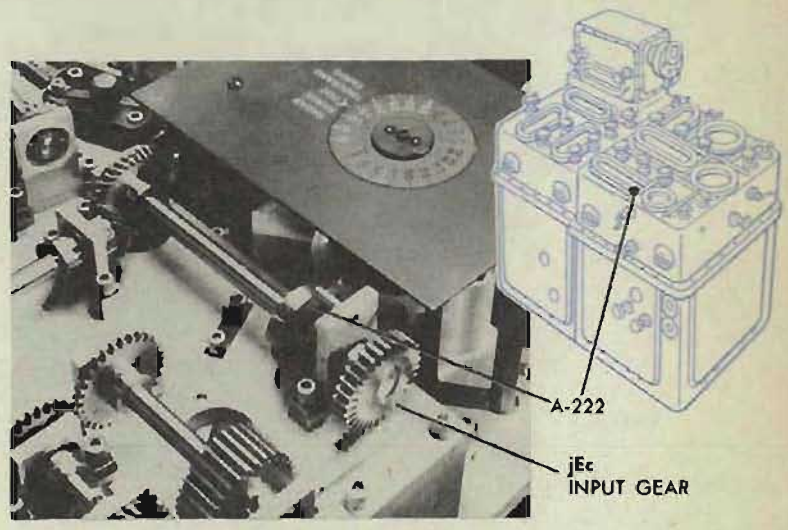
Tighten A-221.
Check A-103.



A-222 jEc HOLDING FRICTION

Location

A-222 is under cover 1, at the top left.



Check

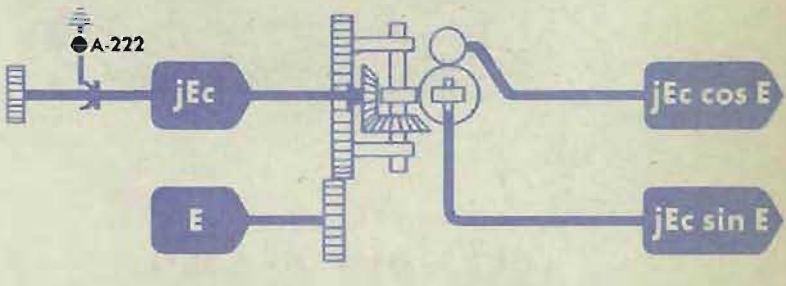
This friction should hold the *jEc* setting without too much drag on the line.

Set *E* at 45°.
Introduce rapid range rate corrections into the rate control group.
No motion of *jdR* should back through the *jEc* line.

Adjustment

If any motion of *jdR* moves the *jEc* input gear, loosen A-222 and turn the clamp clockwise to increase the friction.

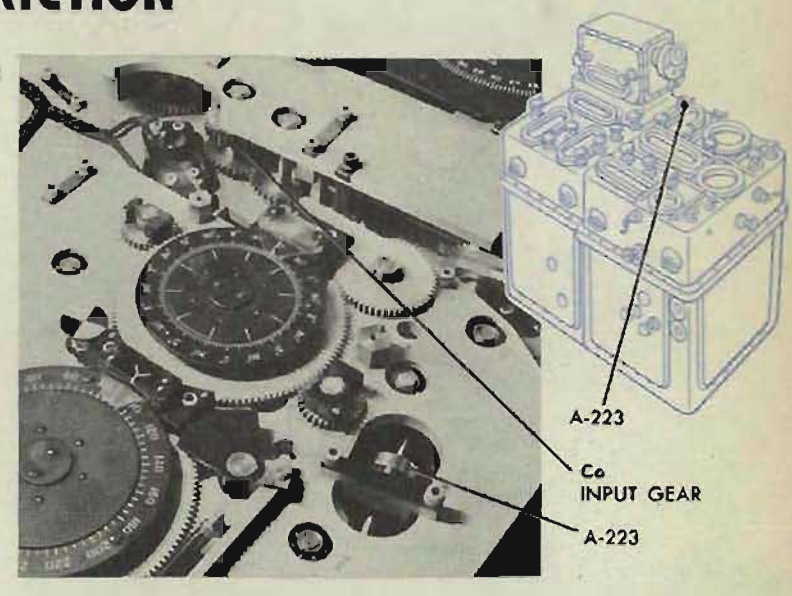
Tighten A-222, and recheck.



A-223 jBc HOLDING FRICTION

Location

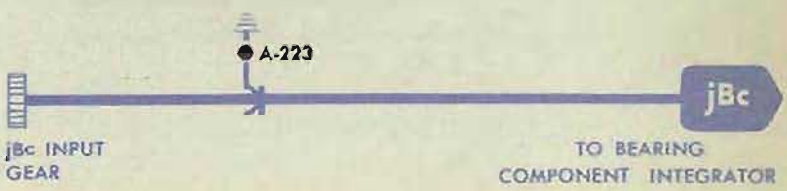
A-223 is under cover 1. It can be reached through the access hole to the rear of the fine *Br* dial.

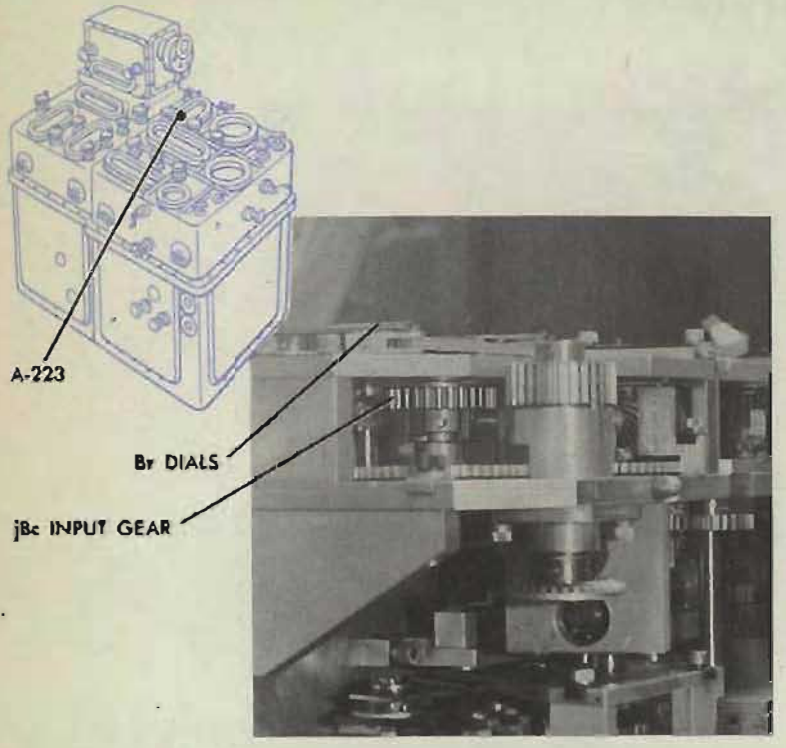


Check

This friction should hold the *jBc* setting without too much drag on the line.

Set *B* at 45°.
Set *E* at 0°.
Introduce rapid range rate corrections into the rate control group.
No motion of *jdRh* should back through the *jBc* line.



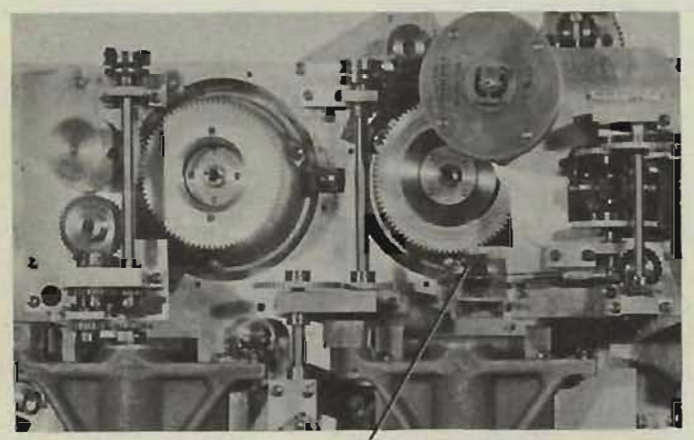


Adjustment

If the *jBc* input gear moves, loosen A-223 and turn the clamp clockwise to increase the friction.

Tighten A-223 and recheck.

A-225 ASSEMBLY CLAMP



INTEGRATOR ASSEMBLY REMOVED FROM INSTRUMENT

Location

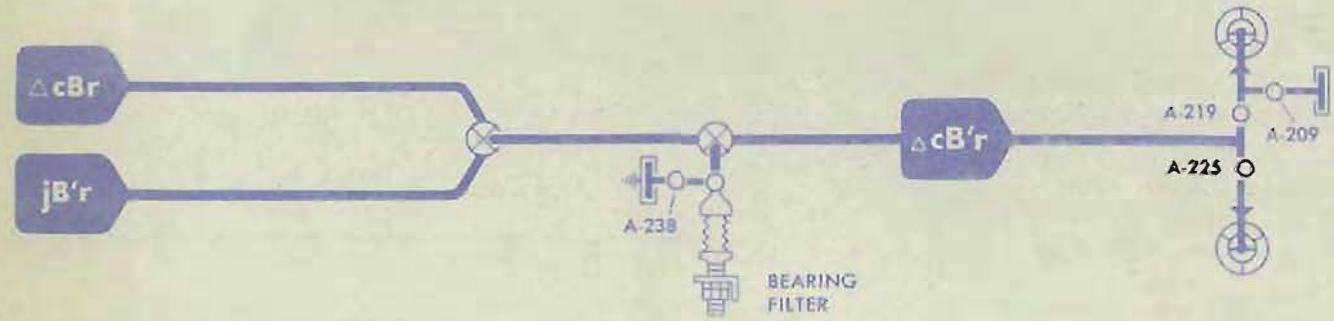
A-225 is under cover 3, on the same shaft as A-219.
It is omitted on Mod 0.

Check

Check that the $\Delta cB'r$ indicating transmitter rotor gear cannot be turned when the $\Delta cB'r$ line is held.

Adjustment

Tighten A-225.

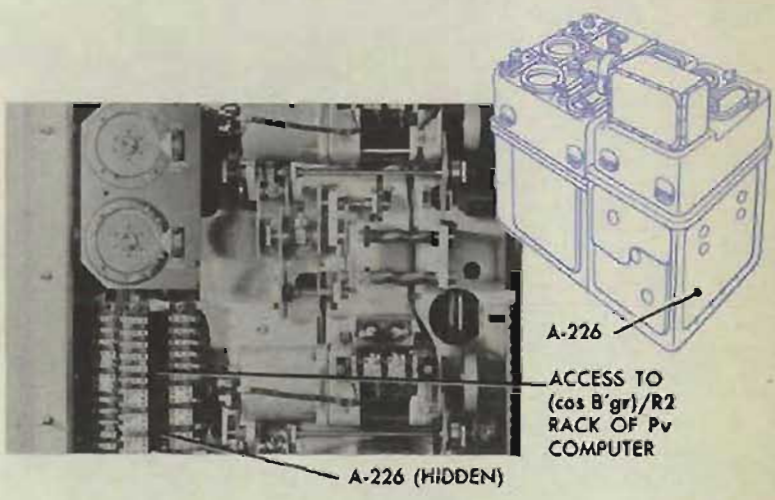


A-226 Pv COMPUTER to PARALLAX COMPONENT SOLVER

Location

A-226 is under cover 7, directly behind terminal 131.
A-226 is omitted on Mods 0-4, 6, 9, and 10.

The (cos *B'gr*)/*R2* rack of the *Pv* computer is below A-226.



Check

Turn the power OFF.

Set *Dd* at 0° and wedge the line.

Set *B'gr* at 90° and wedge the line.
Set *R2* at 18,000 yards.
The (cos *B'gr*)/*R2* rack of the *Pv* computer should be at its zero position.
Turn *E2* from 0° to 85°.
The *Pv* dial should not move.

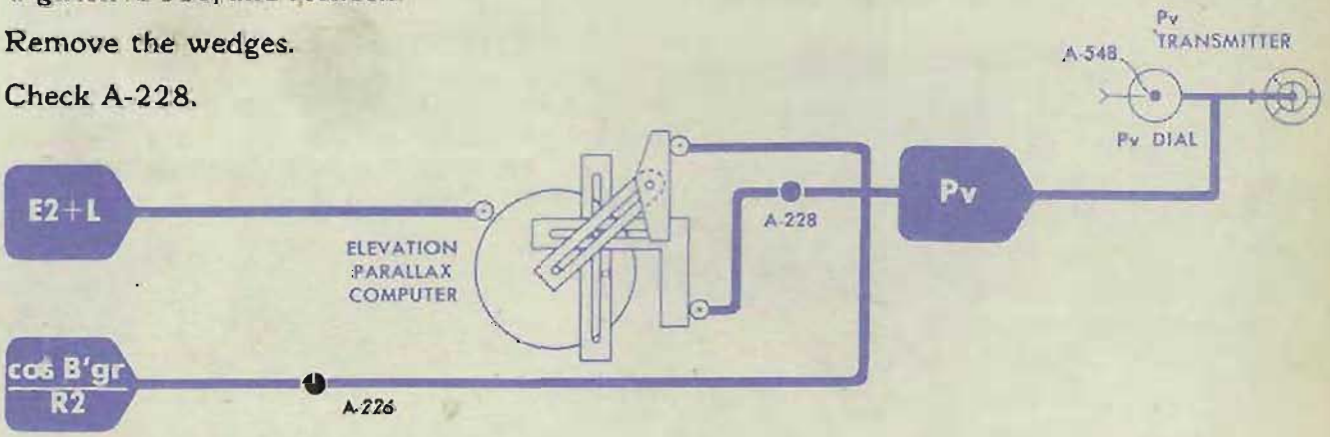
Adjustment

If the *Pv* dial moves, make A-226 slip-tight. Use a gear pusher to move the (cos *B'gr*)/*R2* input rack until its zero position is found. This will be the position where full travel of *E2* causes no motion of *Pv*.

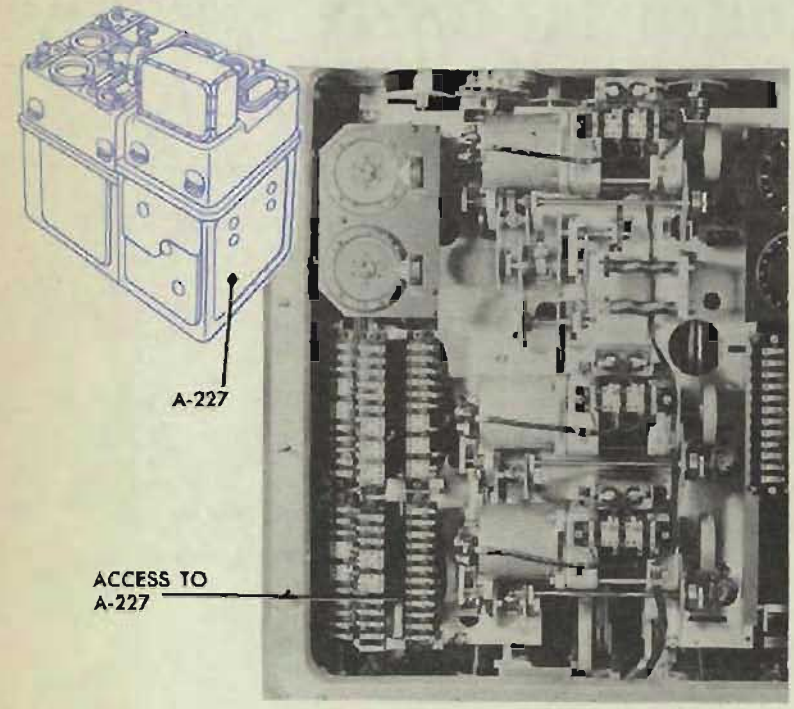
Tighten A-226, and recheck.

Remove the wedges.

Check A-228.



A-227 Pv COMPUTER to E2 + L LINE



Location

A-227 is under cover 7, below the *Pv* computer. It can be seen by looking down at an angle past the lower end of the coarse *E'g* indicating transmitter.
A-227 is omitted on Mods 0-4, 6, 9, and 10.

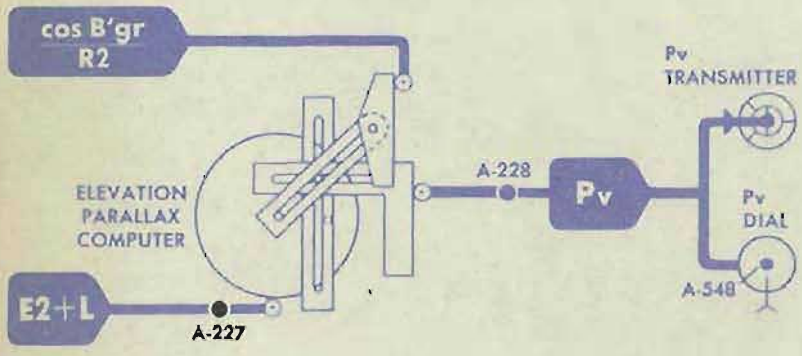
Check

Set *E2* at 0°.
Set *L* at 2000'.
The sin (*E2* + *L*) cam should be at its zero position, where any movement of the (cos *B'gr*)/*R2* input rack causes no motion of the *Pv* dial.

Wedge *B'gr* and *Dd* at 0°, and decrease *R2* from 18,000 to 500 yards. The *Pv* dial should not move.

Adjustment

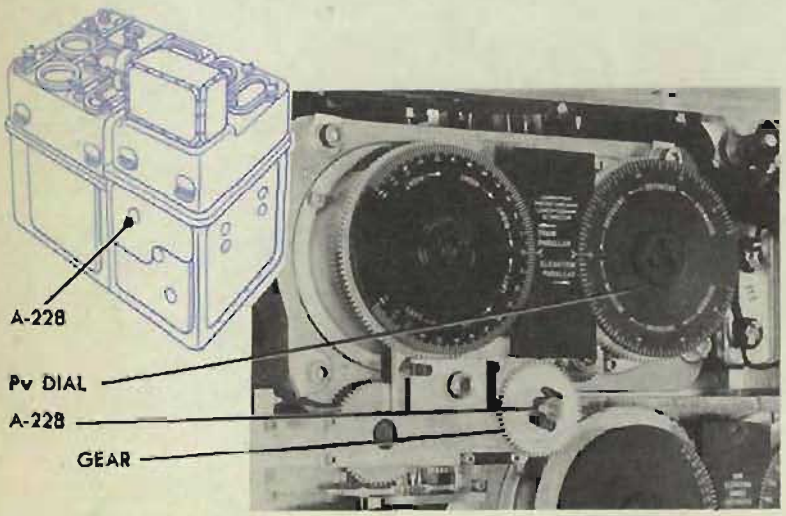
If the *Pv* dial moves, make A-227 slip-tight.



Position the sin (*E2* + *L*) cam until there is no motion of the *Pv* dial for full travel of the (cos *B'gr*)/*R2* rack. The sin (*E2* + *L*) cam is one inch to the right of A-227 and may be moved with a gear pusher.

Tighten A-227, and recheck.
Remove the wedges.
Check A-228.

A-228 Pv DIAL to Pv COMPUTER

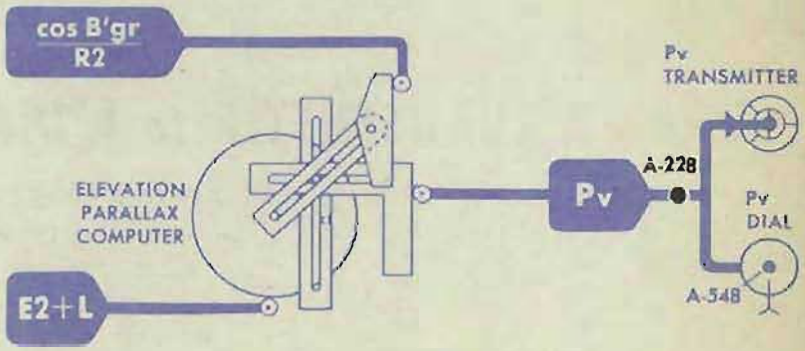


Location

A-228 is under cover 6, below the end of the mask for the *Ph* and *Pv* dials.
A-228 is omitted on Mods 0-4, 6, 9, and 10.

Check

Turn the power OFF.
Set *E2* at 0°.
Set *L* at 2000′.
Set *Dd* at 0° and wedge the line.
Set *B′gr* at 90° and wedge the line.
The *Pv* dial should read 0°.



Adjustment

If the *Pv* dial does not read 0°, make A-228 slip-tight.

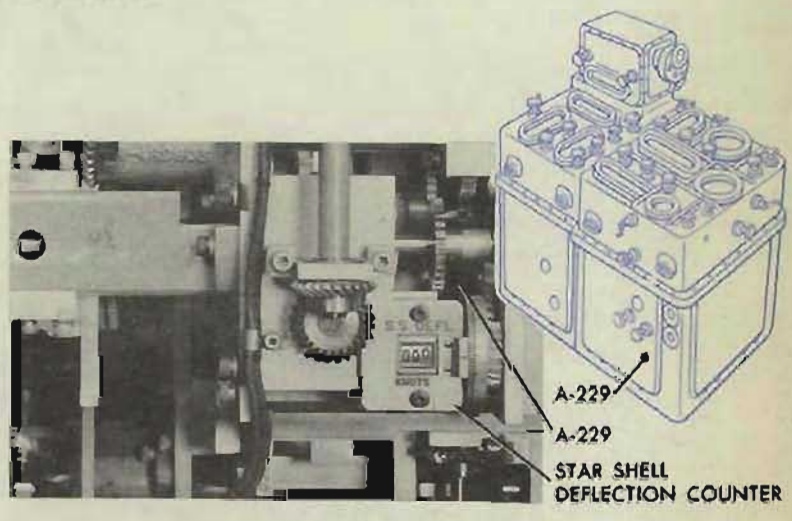
Slipping through A-228, turn the gear next to the clamp until the *Pv* dial is at 0°.

Tighten A-228, and recheck.
Remove the wedges.
Check A-548.

A-229 STAR SHELL DEFLECTION COUNTER to WrD + KRdBs LINE

Location

A-229 is under cover 3.
A-229 is omitted on Mods 0, 1, 2, 3, 9, and 10.

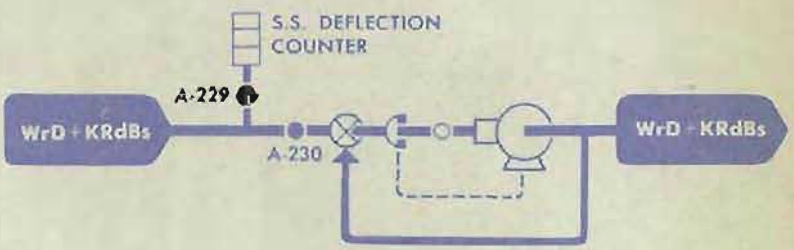


Check

Turn the power ON.
Set *Sh*, *So*, and *Sw* at 0 knots.
Set *A*, *Br*, and *Bws* at 0°.
Set *Ds* at 500 mils.
The star shell deflection counter should read 0 knots.

Adjustment

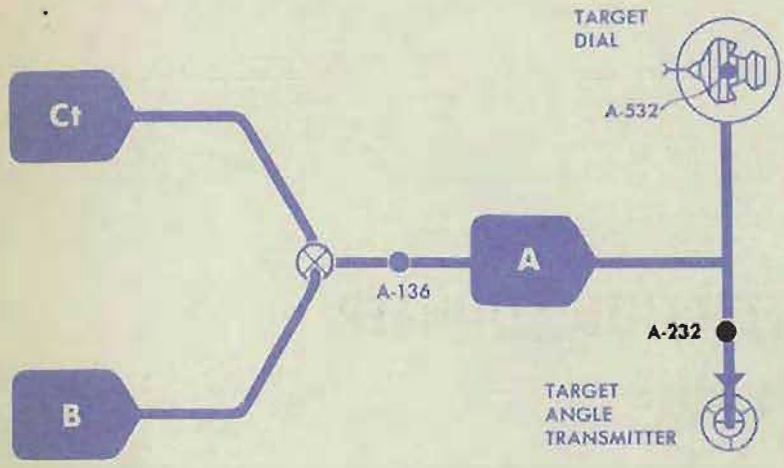
If the counter does not read 0 knots, loosen A-229. Bring the counter to 0 by turning the small spur gear which meshes with the gear on the drum of the counter.



Tighten A-229 and recheck.
Check A-230.

A-230 and A-231 STAR SHELL COMPUTER ADJUSTMENTS

A-232 A TRANSMITTER to A DIAL



Location

A-232 is under cover 1, mounted on a worm, to the rear of the *A* transmitter.

A-232 is omitted on Mods 0, 1, 2, and 9. It is also omitted on all instruments with Ser. Nos. 421 and higher. In other instruments, Ser. Nos. 420 and lower, the *A* transmitter was altered to the *Ct* transmitter, and A-232 became an assembly clamp.

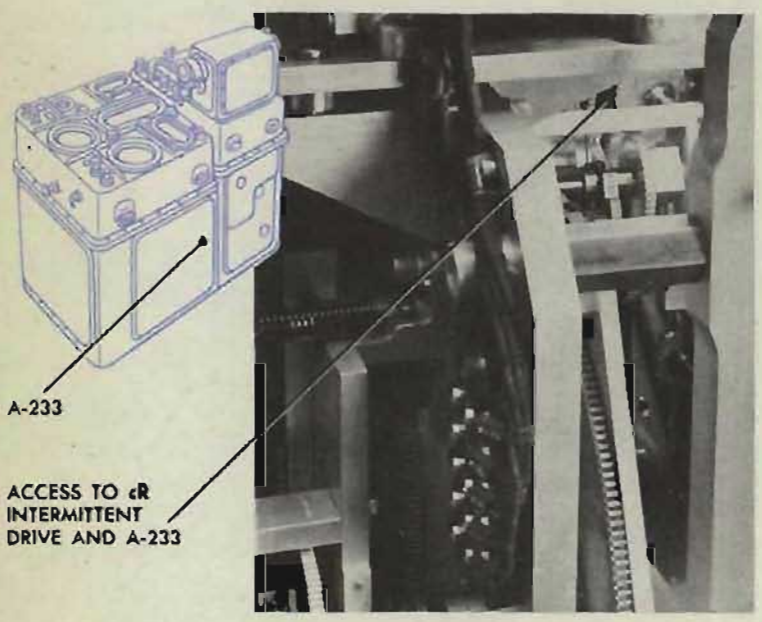
Check

A-232 should be tight. The worm on which it is mounted should be out of mesh.

Adjustment

Tighten A-232 when the worm is out of mesh.

A-233 cR INTERMITTENT DRIVE to cR DIALS



Location

A-233 is under cover 5, to the rear of the integrator mounting plate.

A-233 is omitted on Mods 0, 1, 2, and 9.

Check

Decrease *cR*.
Observe the output gear of the intermittent drive. It should stop turning when the *cR* dials read 750 yards. The intermittent drive is then at its lower cut-out point.

Adjustment

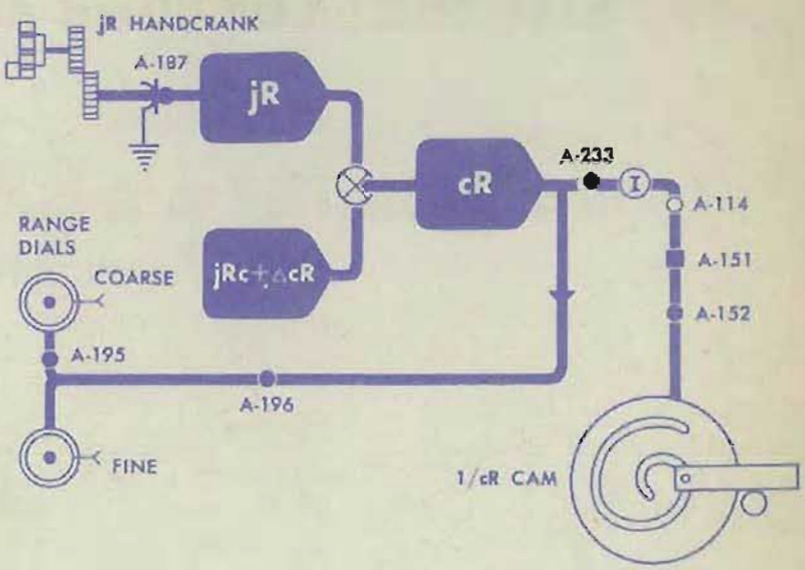
If the intermittent drive output gear does not stop turning when *cR* is decreased to 750 yards, make A-233 slip-tight.

Turn *cR* in a decreasing direction to the exact point where the intermittent drive cuts out.

Hold the large gear in the intermittent drive with a gear pusher. Bring *cR* to 750 yards with the *jR* handcrank.

Tighten A-233.

Increase *cR* until the intermittent drive output gear stops turning. This is the upper cut-out point. The *cR* dials should read 22,500 yards. Recheck at the lower cut-out point. Check A-114 and A-151.



A-234 and A-235 Rj COUNTERS to L-29

A-234 and A-235 are omitted in Mods 0, 1, 2, 5, 6, "Old" Mod 7, and Mod 9. In these mods, see A-502.

Location

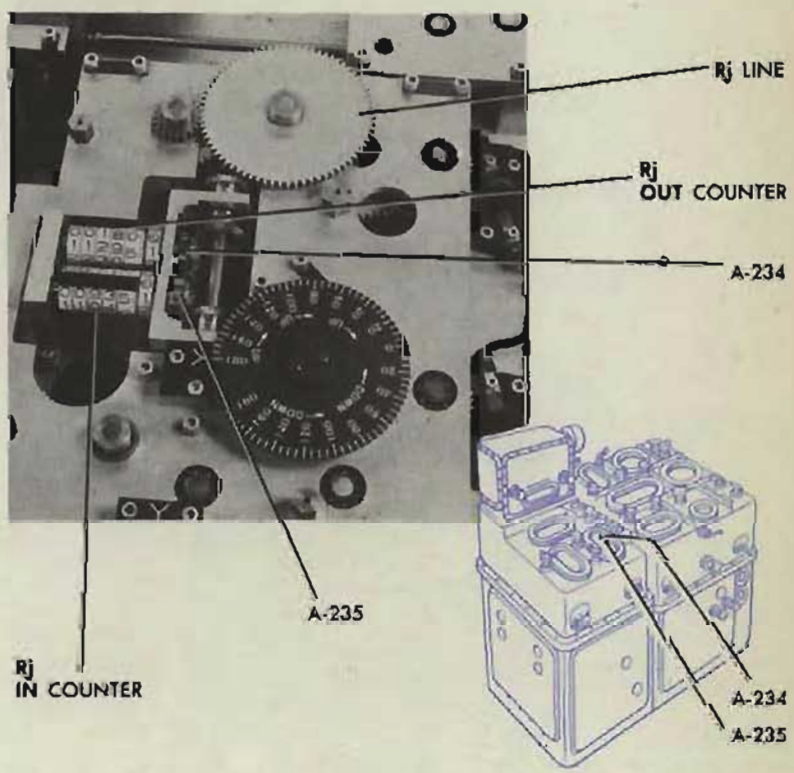
A-234 and A-235 are under cover 2, below the dial mask for the *Rj* counters. They are on the ends of the *Rj* counter shafts.
A-234 is on the *Rj* OUT counter.
A-235 is on the *Rj* IN counter.
L-29 is under cover 5, in a horizontal position, with its lower limit toward the front.

Check

L-29 should reach the lower limit when the *Rj* IN counter reads 12,000 yards, and the upper limit when the *Rj* OUT counter reads 1800 yards.

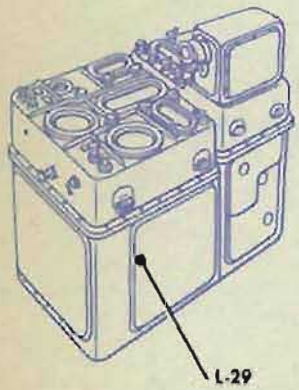
A-235 Check

Run *Rj* to its IN limit. The *Rj* IN counter should read 12,000 yards.



A-235 Adjustment

If the *Rj* IN counter does not read 12,000 yards, make A-235 slip-tight. Set the counter at 12,000 yards. Tighten A-235.



A-234 Check

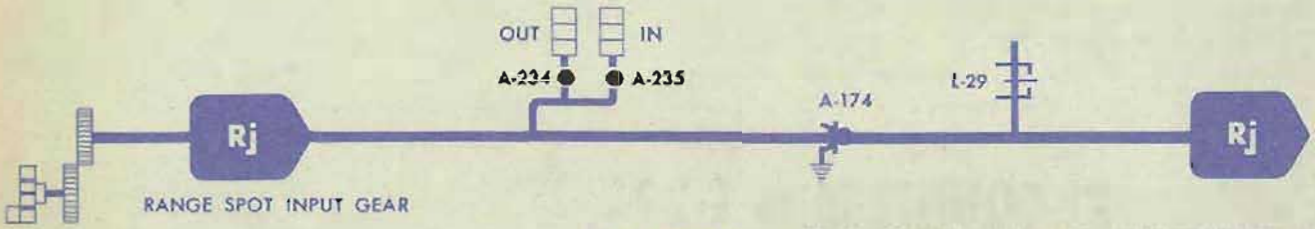
Run *Rj* to the OUT limit. The *Rj* OUT counter should read 1800 yards.

A-234 Adjustment

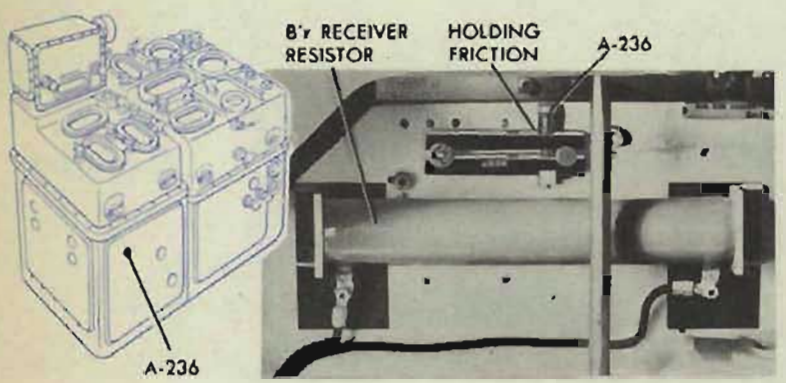
If the *Rj* OUT counter does not read 1800 yards, make A-234 slip-tight. Set the counter at 1800 yards. Tighten A-234.

Recheck

Again run L-29 to its limits. The *Rj* IN counter should read 12,000 yards at the lower limit and the *Rj* OUT counter should read 1800 yards at the upper limit. Split any overtravel and check that the counters read zero simultaneously.



A-236 Dd HOLDING FRICTION



Location

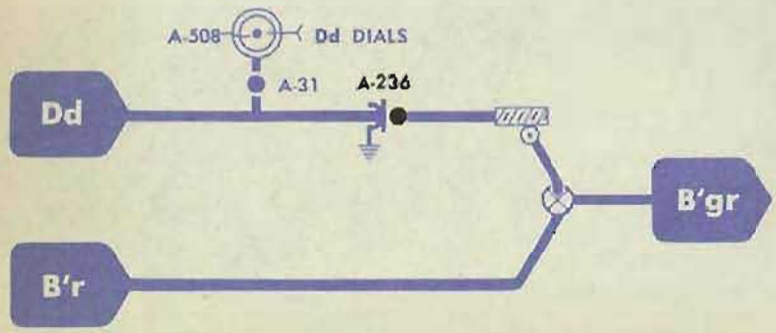
A-236 is under cover 8, above the *B'r* receiver resistor.
A-236 is not in Mod 0.

Check

This friction should be tight enough to prevent *B'r* from backing out *Dd* when the *B'r* receiver is driving *B'gr*. It should not be so tight as to overload the *Dd* servo motor.

Adjustment

Tighten the screw all the way down; then back off two turns. Refine the adjustment by tightening or loosening the screw just enough to prevent *B'r* from backing out and yet allow the *Dd* motor to drive freely.



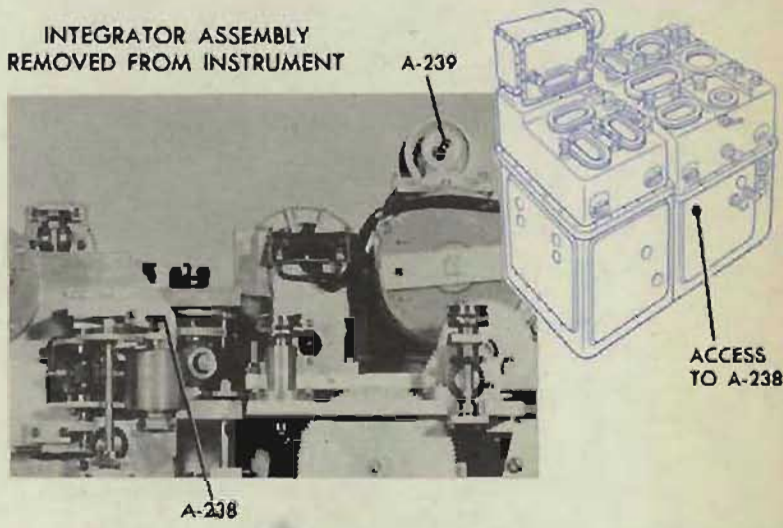
CAUTION

Do not tighten the screw so much that the spring is compressed solidly, as this overloads the *Dd* servo motor.

A-238 ASSEMBLY CLAMP

Location

A-238 is under cover 5, on the upper end of the magnetic drag of the bearing filter.
A-238 is omitted on Mod 0.

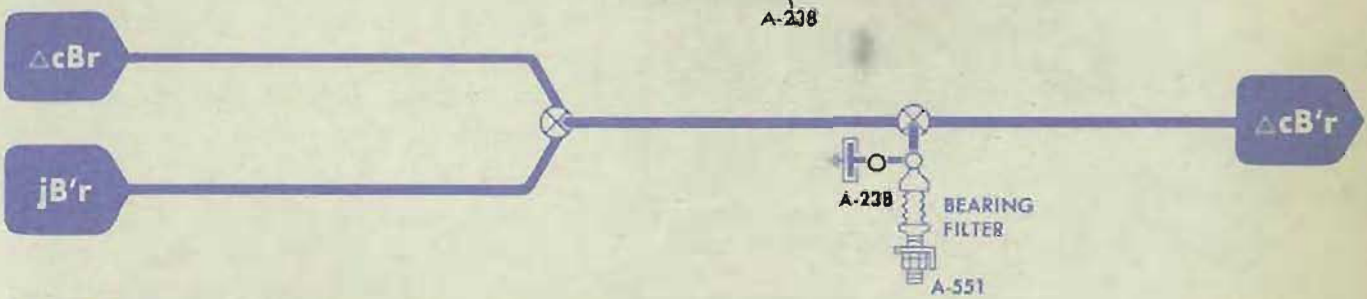


Check

A-238 should be tight, with the gear on which it is mounted in mesh with the sector gear of the bearing filter.

Adjustment

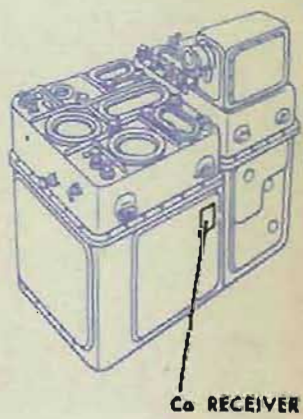
Tighten A-238.



A-239 ASSEMBLY CLAMP

Location

A-239 is under cover 5, on the front end of the magnetic drag on the *Co* receiver.
A-239 is omitted on Mod 0.

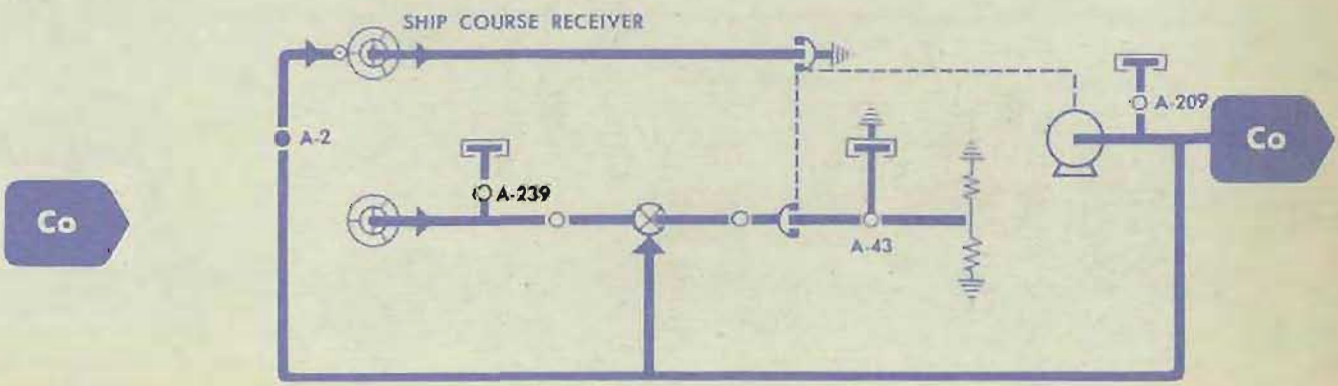


Check

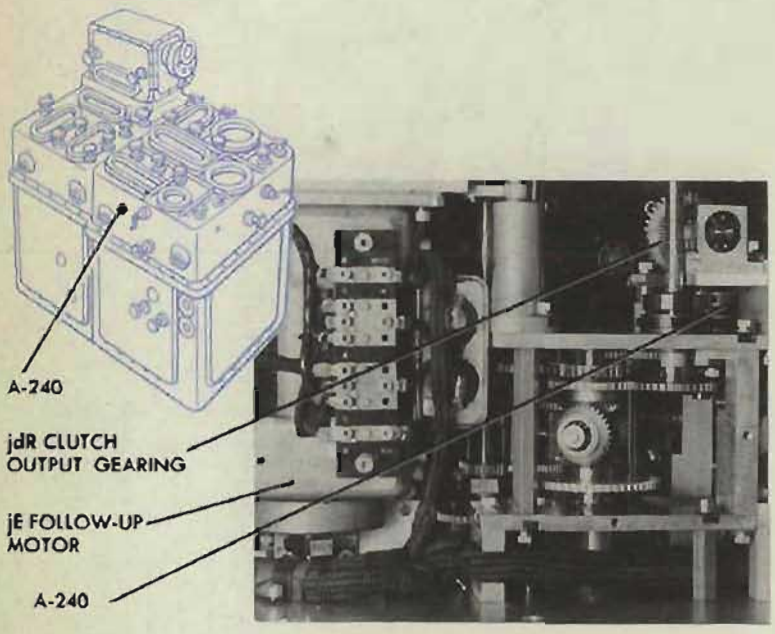
A-239 should be tight, with the gear on which it is mounted in mesh with its mating gear.

Adjustment

Tighten A-239.



A-240 jdR HOLDING FRICTION



Location

A-240 is under cover 1, at the rear of the elevation component integrator. A-240 is omitted on instruments with Ser. Nos. 100 and lower.

Check

This friction should be tight enough to prevent *E* or *jEc* from backing out *jdR*, but not so tight as to overload the *jdR* motor during automatic range rate control.

Turn *E* and observe the *jdR* clutch output gearing. It should remain motionless. Repeat the check, turning *jEc*.

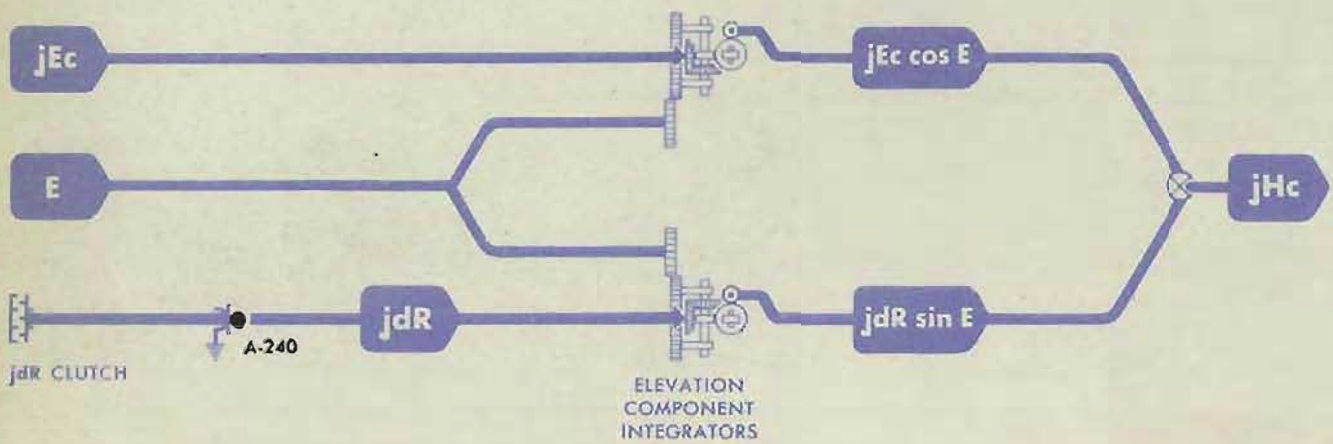
Run the synchronizing test of the range receiver, page 62. Check that the *jdR* motor drives fast enough to synchronize within the prescribed time limit.

Adjustment

If both conditions under the check are not obtained, loosen A-240.
If the *jdR* line backs out, turn the clamp clockwise to increase the friction.
If the *jdR* motor drives too slowly, turn the clamp counterclockwise to decrease the friction.

Tighten A-240 and recheck.

Check A-164.



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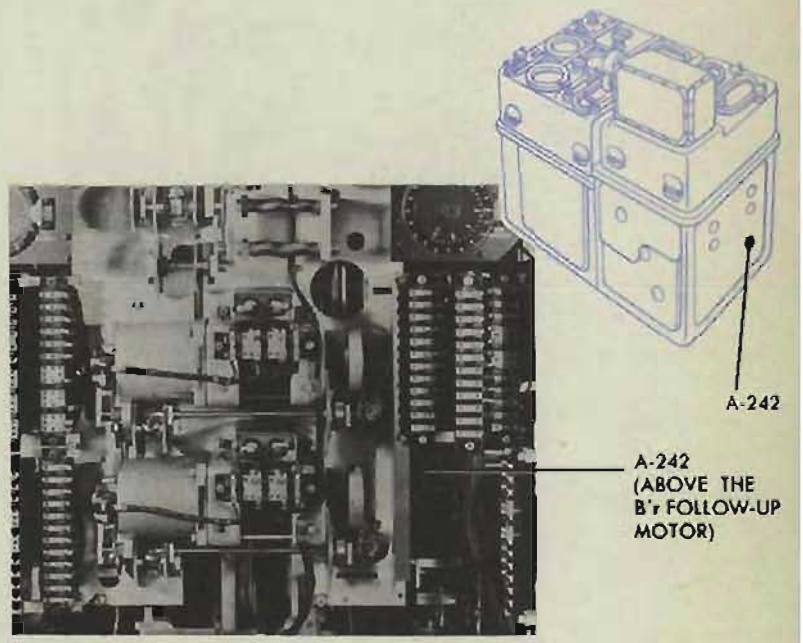
A-242 B'r or B'gr SLIDE GEAR to PARALLAX SECTION

Location

A-242 is located under cover 7. It consists of a flat clamp on a double slide gear. A-242 is omitted on instruments with Ser. Nos. 215 and lower.



Check

Gun train order drives the vector gear of the parallax component solver on CV's and all one-director ships. On these ships the slide gear should be pushed *up* into mesh with the *B'gr* line.

Director train drives the vector gear of the parallax component solver on BB's, CA's, CB's, CL's, and CVB's. On these ships the slide gear should be pushed *down* into mesh with the *B'r* line.

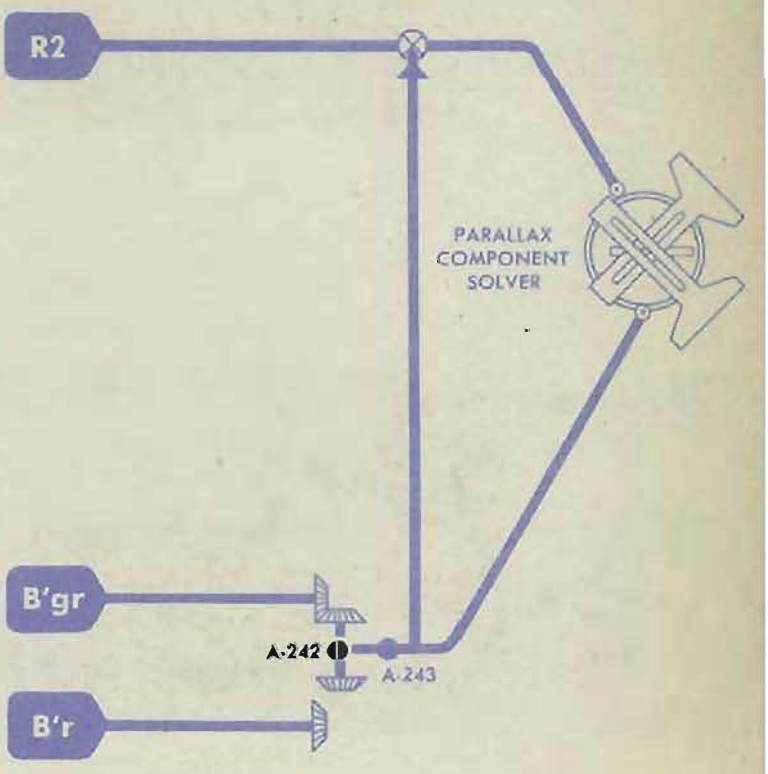
Adjustment

If the slide gear is not adjusted properly, set *B'r* equal to *B'gr*. Loosen the two screws and move the slide gear into mesh with the gear on the proper line.

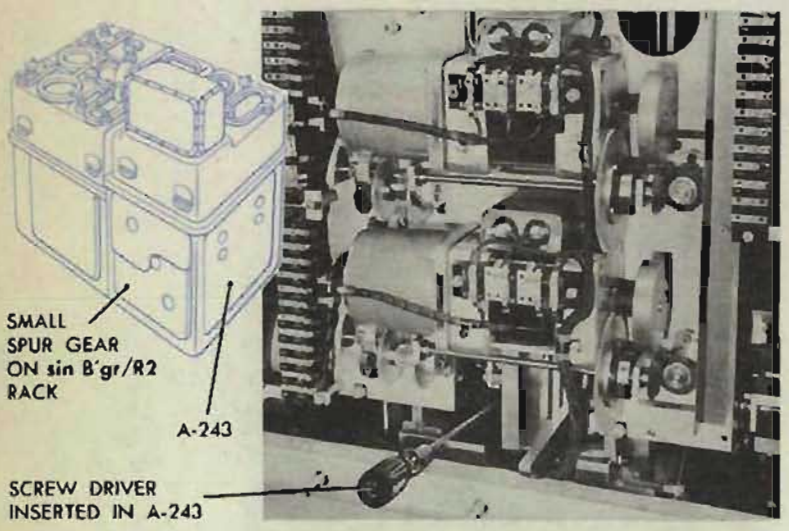
Tighten A-242.

Check to make sure that the gear mesh is not too tight and that there is no excessive lost motion.

Check A-243.

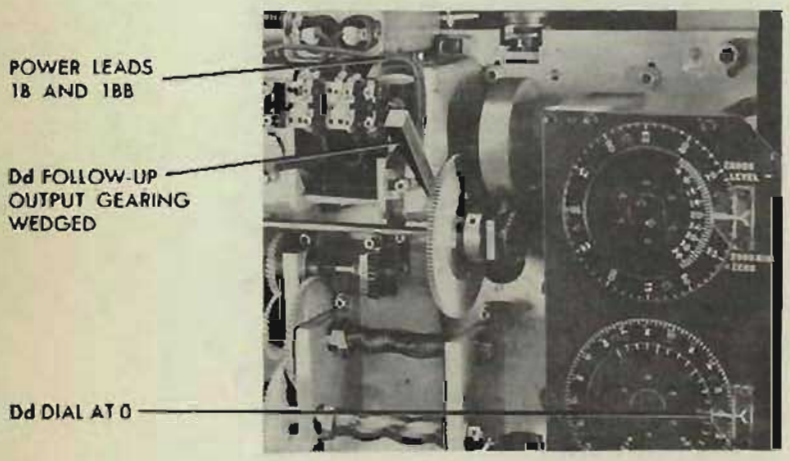


A-243 PARALLAX COMPONENT SOLVER to B'r or B'gr LINE



Location

A-243 is under cover 7, about 18 inches in from an opening below the center of the *Vz* follow-up.
A-243 is omitted on instruments with Ser. Nos. 215 and lower. Use A-68 to make this adjustment.



Rough check

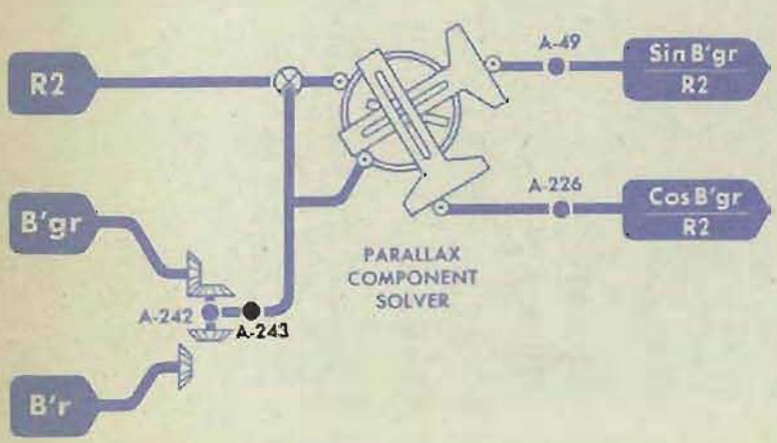
Regardless of whether the *B'gr* or *B'r* line is meshed to the parallax component solver, this method is used.

Set *Dd* at 0°.
Remove leads 1B and 1BB from the *Dd* follow-up and wedge the output gearing.

Turn the power ON.

At the switchboard, turn off the *B'r* receiver switch.

Set the *B'gr* dials at 90° and wedge the line. Decrease *R2*. Use the generated range crank.



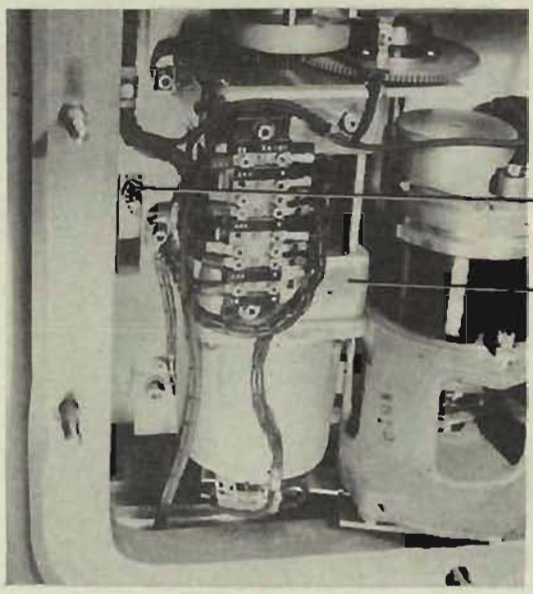
The vector gear slot of the parallax component solver should be at the position where the *Ph* dials turn clockwise when *R2* is decreased. The *Ph* dials turn clockwise when *Ph* is increasing.

Fine check

Set *B'gr* at 0°.

With *B'gr* and *Dd* at 0°, changing *R2* should not move the (sin *B'gr*)/*R2* output rack of the parallax component solver.

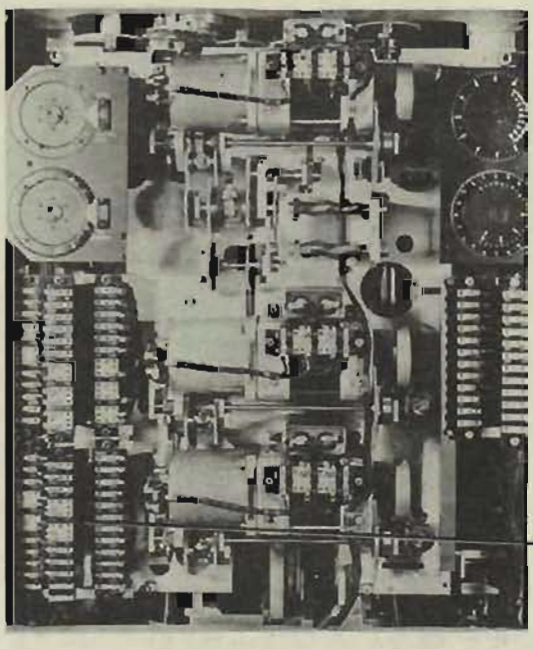
Set *R2* at 18,000 yards and then decrease it to 1500 yards. Motion of the (sin *B'gr*)/*R2* rack can be observed on the small spur gear on which A-49 is mounted, under cover 6. This gear is 6 inches in, at the left side of the *Eb* receiver terminal block.



Adjustment

If there is any movement of the (sin *B'gr*)/*R2* rack during the fine check, make A-243 slip-tight.
Set *R2* at 18,000 yards and mark the small spur gear next to A-49. Decrease *R2* to 1500 yards.
Turn the *B'gr* line to return the spur gear to the original mark.

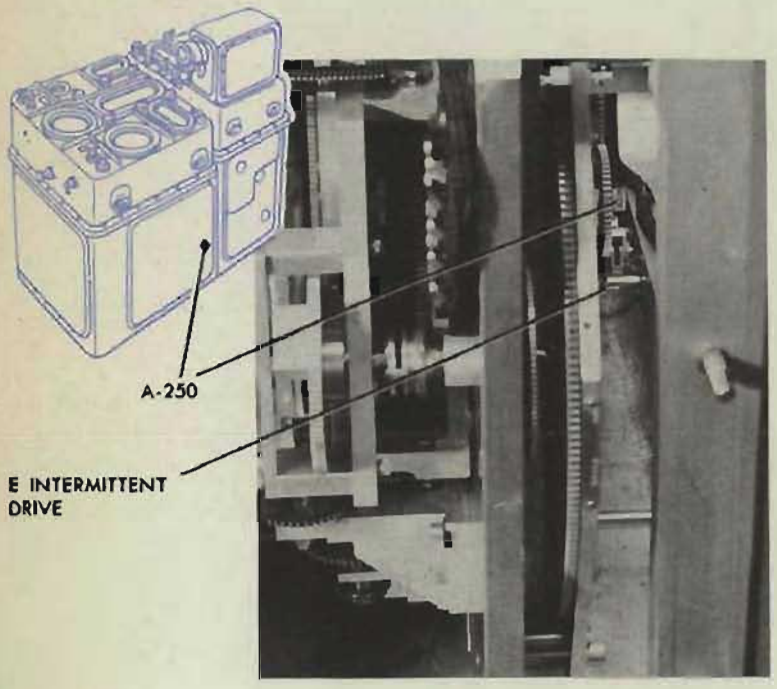
Then hold the vector gear in position, and turn the *B'gr* line to bring the *B'gr* dials to zero, slipping at A-243.
The vector gear may be held in position by holding the large bevel gear 12 inches in from the lower right terminal block. This gear is in line with terminal 163 and the inner end of the coarse *E'g* indicating transmitter.



Tighten A-243, and recheck.

Replace leads 1B and 1BB on the *Dd* follow-up. Check A-226 and A-49.

A-250 E INTERMITTENT DRIVE to E DIALS



Location

A-250 is under cover 5, to the rear of the large integrator mounting plate. It is on the spur gear input of the *E* intermittent drive.

A-250 is on instruments with Ser. Nos. 390 and higher, only.

Check

Decrease *E*. The output gear of the intermittent drive should stop turning when the *E* dials read −2°. The intermittent drive is then at its lower cut-out point.

CAUTION

If *E* cannot be decreased to −2°, A-146 or A-147 is upset and the end of travel has been reached on the sec *E* cam or the sec *E* integrator. If any restriction can be felt, loosen A-146.

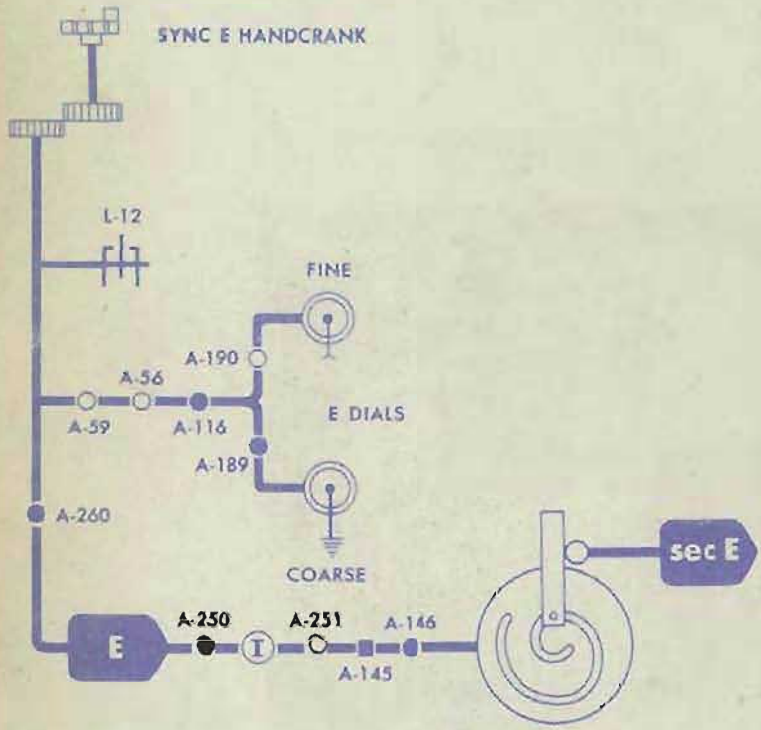
Adjustment

If the intermittent drive output gear does not stop turning at −2°, make A-250 slip-tight.

Turn *E* in a decreasing direction until the point is reached where the intermittent drive output gear just stops turning. Use a gear pusher to hold the large gear in the intermittent drive. Bring the *E* dials to −2° with the sync *E* handcrank.

Tighten A-250 and recheck.
Increase *E* until the output gear stops turning. The *E* dials should read +85°. This is the upper cut-out point of the intermittent drive.
Check A-251.

Readjust A-146, A-145, and A-147.



A-251 ASSEMBLY CLAMP

See A-114.

A-254 ASSEMBLY CLAMP (Mods 8 and 12)

Location

A-254 is under cover 7, on the input to the *R2* intermittent drive, behind the *E'g* indicating transmitters.

Check

Check A-92.
Check A-156 (Mods 8 and 12).
If the intermittent drive cuts out at the wrong point, but A-92 is correctly adjusted, A-254 is in error.

Adjustment

Readjust A-254 in accordance with the procedure for adjusting A-156 on Mods 8 and 12.

Check A-255 and A-256.

A-255 ASSEMBLY CLAMP (Mods 8 and 12)

See A-114.

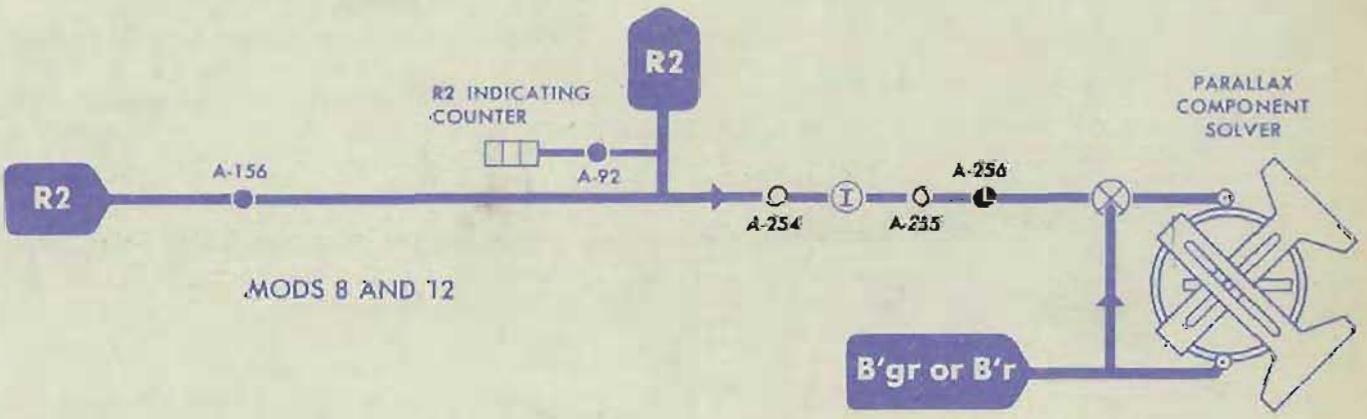
A-256 PARALLAX COMPONENT SOLVER to R2 COUNTER (Mods 8 and 12)

Location

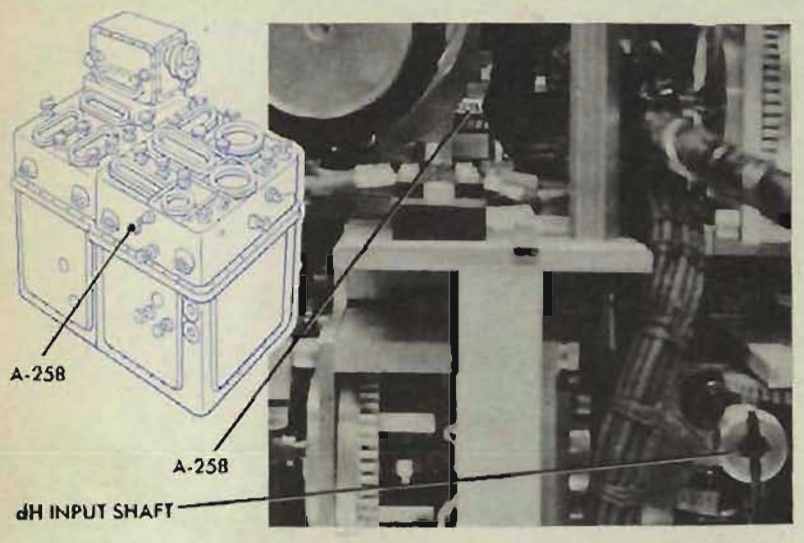
A-256 is under cover 7 on the output of the *R2* intermittent drive.

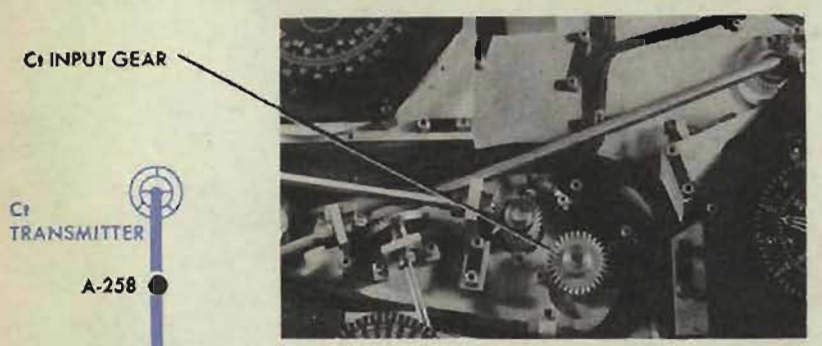
Check and adjustment

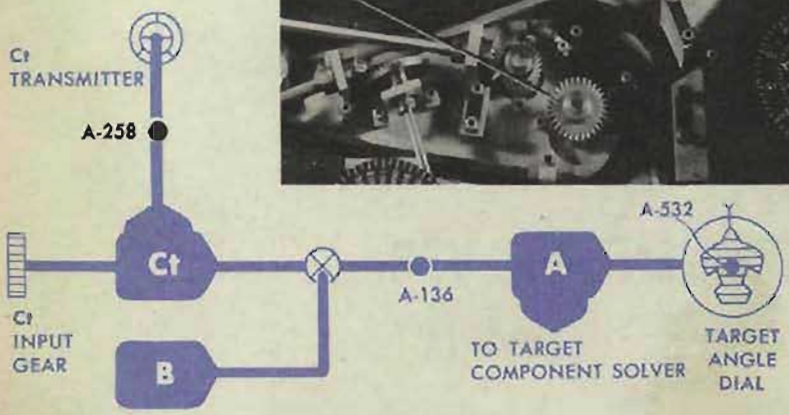
Refer to the check and adjustment of A-156 on other mods.



A-258 Ct TRANSMITTER to A DIAL







Location

A-258 is under cover 1, to the front of the *Ct* transmitter.

Note

The *Ct* transmitter was formerly the *A* transmitter. Check that A-232 is tight and properly out of mesh on Ser. Nos. 420 and lower except on Mods 0, 1, 2, and 9, where it is omitted. A-258 is also omitted on Mods 0, 1, 2, and 9.

Check

Connect a standard motor (test synchro) to the *Ct* transmitter terminals.
Set *B* at 180°.
Set *A* at 0°.
The rotor of the *Ct* transmitter synchro should be on electrical zero. It is on electrical zero when the standard motor dial index matches the fixed index.

Adjustment

If the rotor of the synchro is not on electrical zero, make A-258 slip-tight.
Use the *Ct* input gear to turn the rotor until the synchro is on electrical zero.
Secure the rotor by holding the worm about 2 inches above A-258.
Turn the *Ct* input gear to bring *A* back to 0°.
Tighten A-258, and recheck.
Disconnect the standard motor from the *Ct* transmitter.

A-259 E COUNTER IN CORRECTOR UNIT to E DIALS

Location

A-259 is centrally located, where the corrector and computer units join, accessible from cover 8.

Check

The reading on the *E* counter in the corrector unit should agree with the reading on the *E* dials.
NOTE: The *E* counter is installed only in computers with Ser. Nos. 435 and higher.

Adjustment

If the counter reading does not agree with the dial reading, slip-tighten A-259. Set the counter to read the same value as the *E* dials.
Tighten A-259.

Check A-260.

A-260 E COUNTER IN COMPUTER UNIT to E DIALS

Location

A-260 is located where the computer and corrector units join, a few inches away from A-259. It is accessible from cover 5.

Check

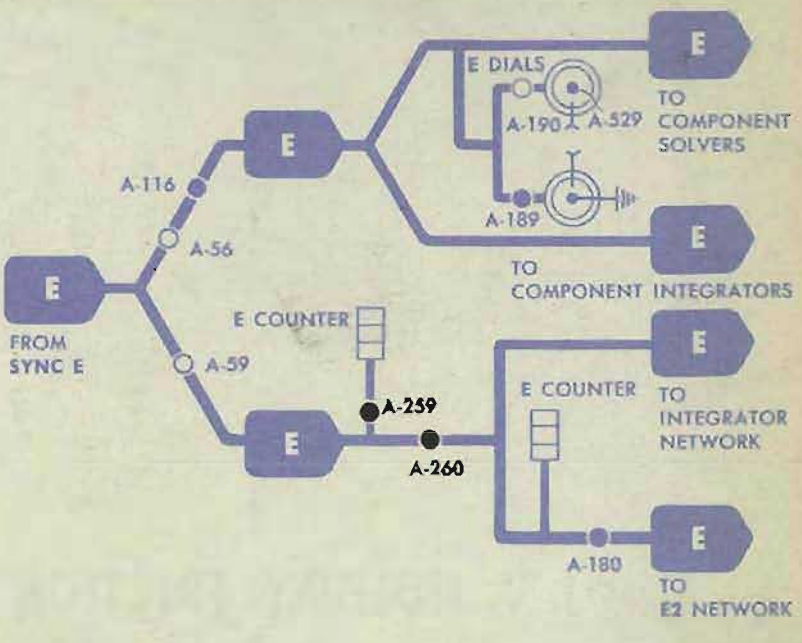
The reading on the *E* counter in the computer unit should agree with the reading on the *E* dials.

NOTE: The *E* counter is installed only in computers with Ser. Nos. 435 and higher.

Adjustment

If the *E* counter reading does not agree with the *E* dial reading, slip-tighten A-260. Set the *E* counter to read the same value as the dials. Tighten A-260 and recheck.

NOTE: A-260 and A-259 are usually adjusted at the same time.



A-261 ASSEMBLY CLAMP

Location

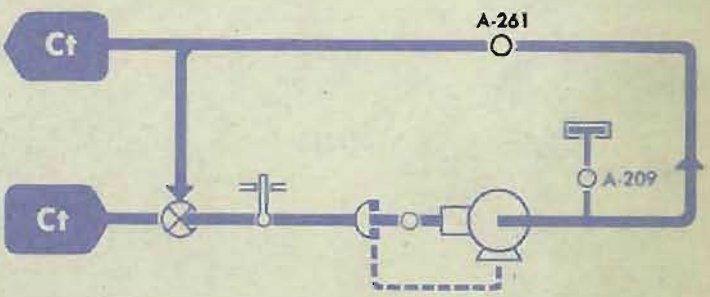
A-261 is under cover 1, in the *Ct* follow-up control gearing.

Check

A-261 should be tight.

Adjustment

Tighten A-261.



A-262 Tg + F − Tf LINE to L-14

Location

A-262 is under cover 3, above the *I.V.* dial, on Ser. Nos. 781 and higher.

Check

Turn the power OFF.

On Mod 13:

Set *Tg* at 0 sec.; set *F* at 51 sec.; turn *Tf*.

L-14 should act when *Tf* reads 1 and 51 sec.

On Mods 8 and 12:

Set *Tg* at 5 sec.; set *F* at 48 sec.; decrease *Tf*.

Upper limit of L-14 should act when *Tf* reads 3 sec.

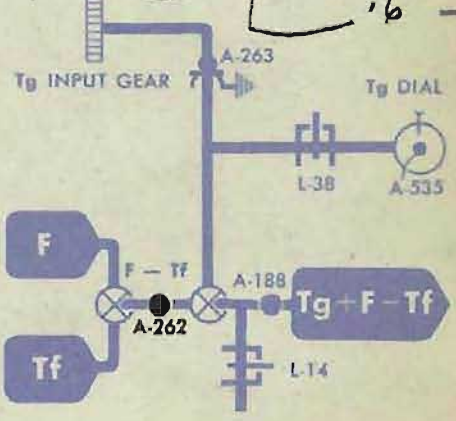
Set *F* at 45 sec.; increase *Tf*.

Lower limit of L-14 should act when *Tf* reads 50 sec.

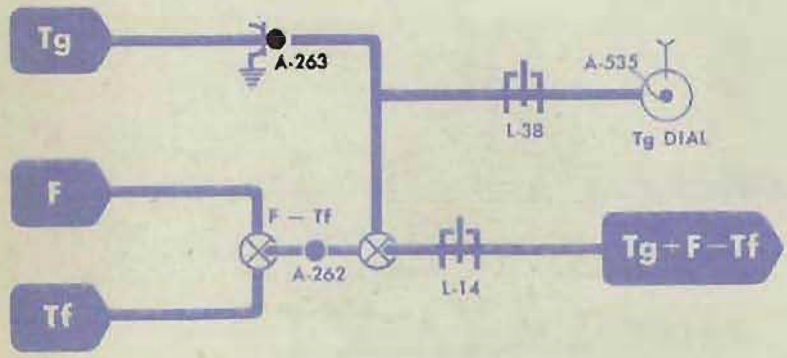
Adjustment

If the limits of L-14 are incorrect, loosen A-262. Hold the *Tg* + *F* − *Tf* line against the limit. Turn the *Tf* line until the counter reads the correct value. Tighten A-262, and check the other limit.

Check A-188.



A-263 Tg HOLDING FRICTION



Location

A-263 is under cover 3, behind the *Tg* input gear on Ser. Nos. 781 and higher.

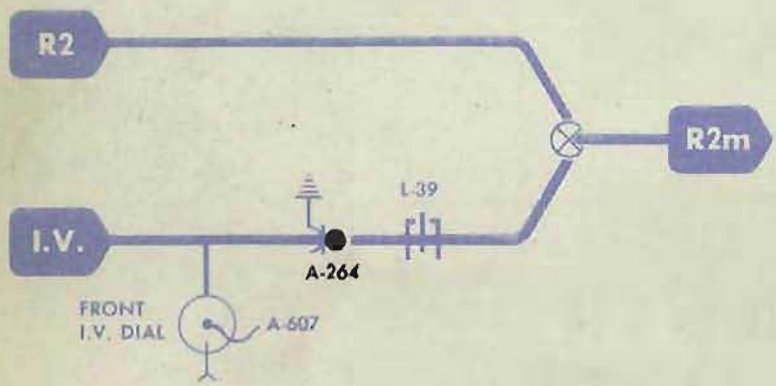
Check

The *Tg* friction load should be heavy enough to hold the *Tg* dial on its setting during operation of the computer.

Adjustment

Loosen the screw in A-263. Turn the clamp clockwise to increase the friction. Tighten the screw.

A-264 I. V. HOLDING FRICTION



Location

A-264 is under cover 4, in the *Tf/R2* ballistic computer gearing, to the right of the *I.V.* dial, on Ser. Nos. 811 and higher.

Check

The friction should be tight enough to hold the *I.V.* setting.

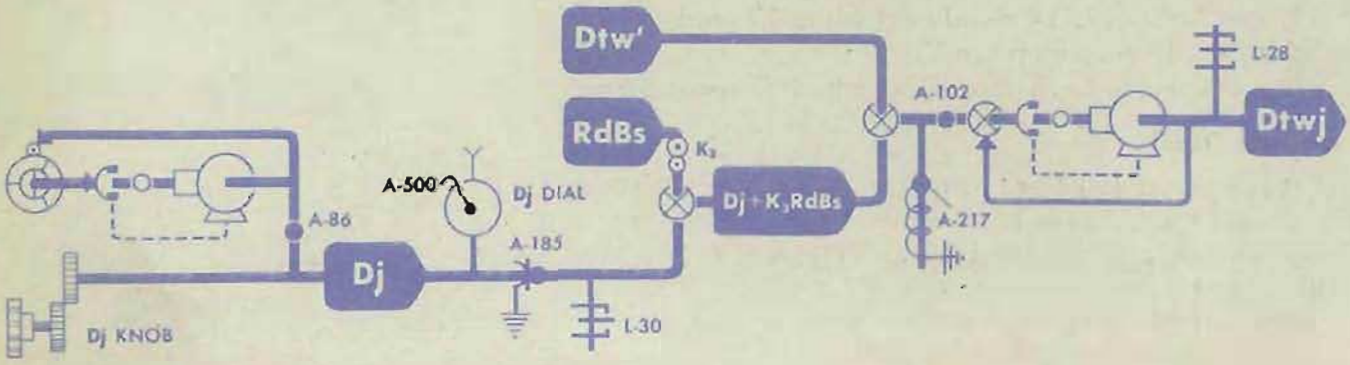
Adjustment

Loosen the screw in A-264. Turn the clamp clockwise to increase the friction.
Tighten the screw.

A-500 Dj DIAL to L-30

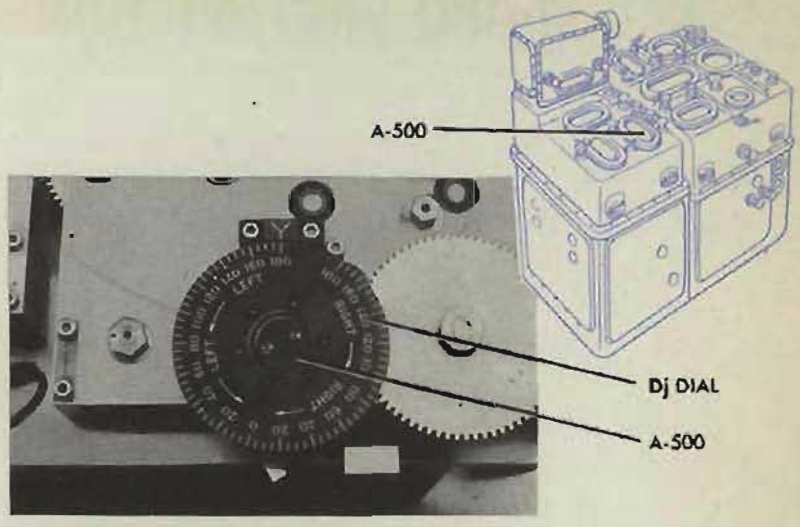
Location

A-500 is under cover 2, on the *Dj* dial.



Check

Decrease *Dj* until the lower limit of L-30 is reached. The *Dj* dial should read LEFT 180 mils.



Adjustment

If the *Dj* dial does not read LEFT 180, loosen A-500. Hold the line against the stop, and slip the dial to the correct reading. Tighten A-500 and check at the upper limit. The *Dj* dial should read RIGHT 180.

Readjust A-86. Check A-102.

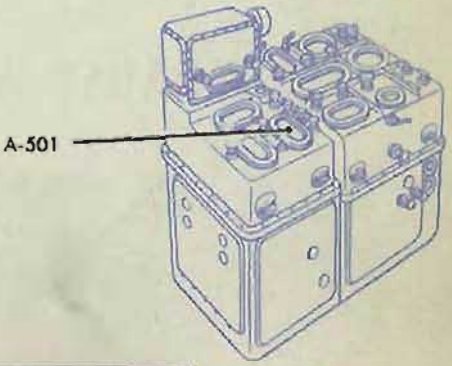
A-501 Vj DIAL to L-31

Location

A-501 is under cover 2 on the *Vj* dial.

Check

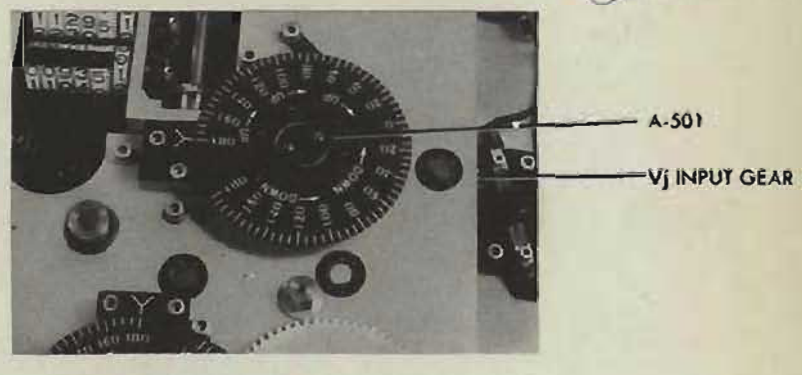
Turn the power OFF.
Turn the *Vj* input gear to increase *Vj* until the upper limit of L-31 is reached.
The dial should read UP 180 mils.



On Mods 8 and 12, the upper limit is 342.5 mils (24,600 yards on the overlaid transparent dial).

Adjustment

If the *Vj* dial does not read the proper value, loosen A-501. Hold the *Vj* line against the stop, and slip the dial to the correct reading.

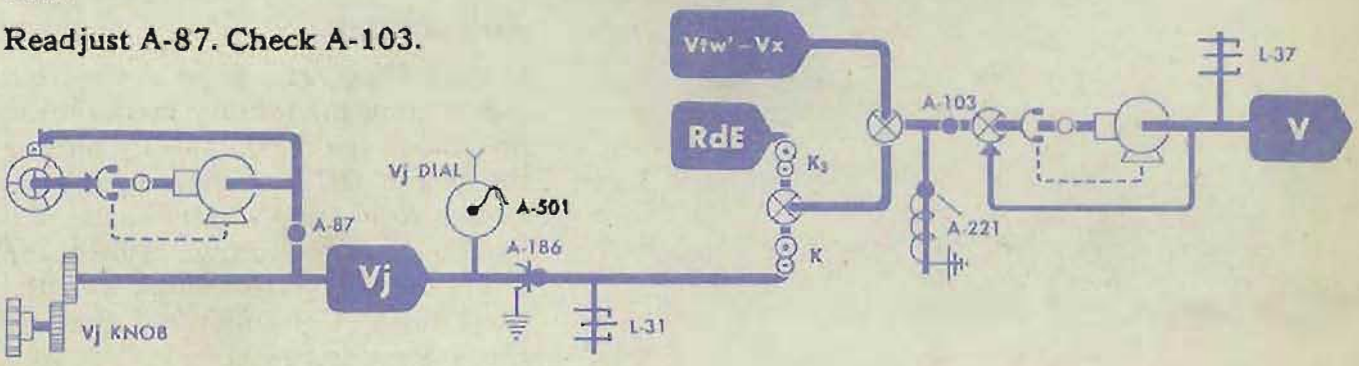


Tighten A-501.

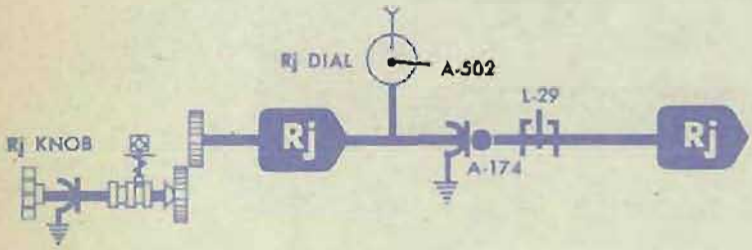
Recheck

Run the *Vj* line to the lower limit. The *Vj* dial should read DOWN 180 mils.

Readjust A-87. Check A-103.



A-502 Rj DIAL to L-29



Location

A-502 is under cover 2 on the *Rj* dial, on Mods 0, 1, 2, 5, 6, "Old" 7, and 9, only.

Check

Turn *Rj* to the upper limit of L-29. The *Rj* dial should read 1800 yards OUT.

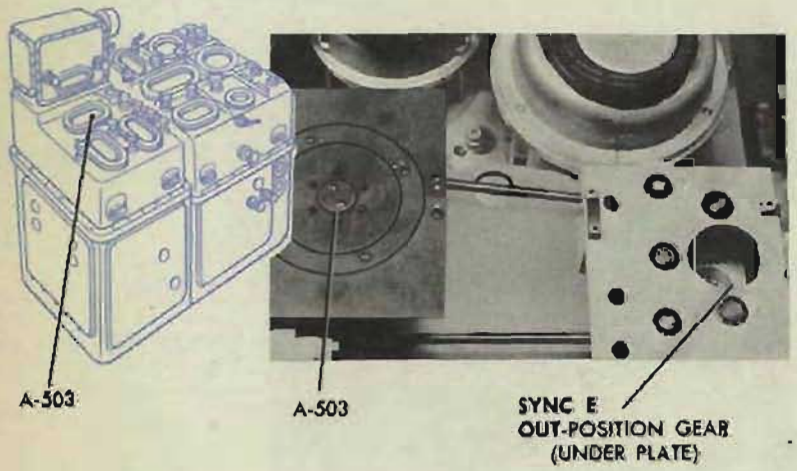
Turn *Rj* to the lower limit. The *Rj* dial should read 1800 yards IN.

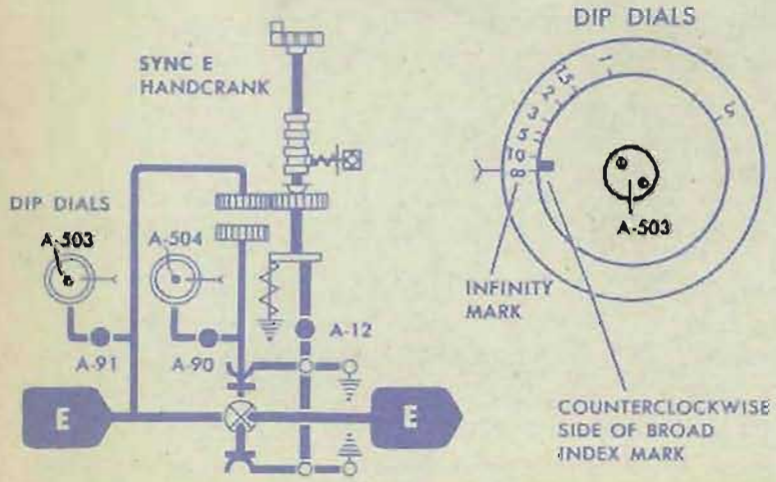
Adjustment

Loosen A-502.
Hold the *Rj* line against the limit stop.
Slip the dial to the proper reading.
Tighten A-502, and check at the other limit.

Check A-104 and A-88.

A-503 COARSE to FINE DIP DIAL





Location

A-503 is under cover 2, on the coarse dip dial.

Check

Set the counterclockwise side of the broad index mark on the coarse dial against the fixed index. The infinity mark of the fine dial should also be at the fixed index.

Set the clockwise side of the broad index on the coarse dial against the fixed index. The ring dial should read 0.5.

Adjustment

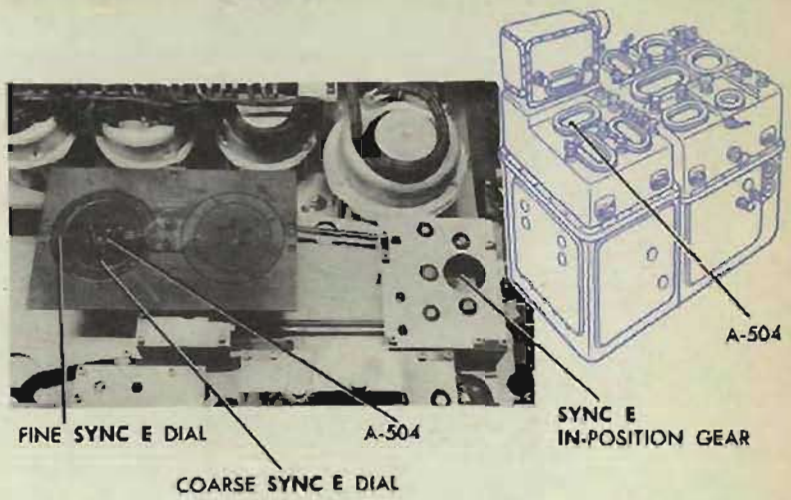
If the dials do not agree at the fixed index, bring the infinity mark on the fine dial to the fixed index by turning the sync *E* OUT-position input gear. Loosen A-503 and slip the coarse dial until the counterclockwise side of the broad index mark is in line with the fixed index. Tighten A-503, and recheck. Readjust A-91.

Table of Contents

A-504 COARSE to FINE SYNC E DIAL

Location

A-504 is under cover 2, on the hub of the coarse sync *E* dial.



Check

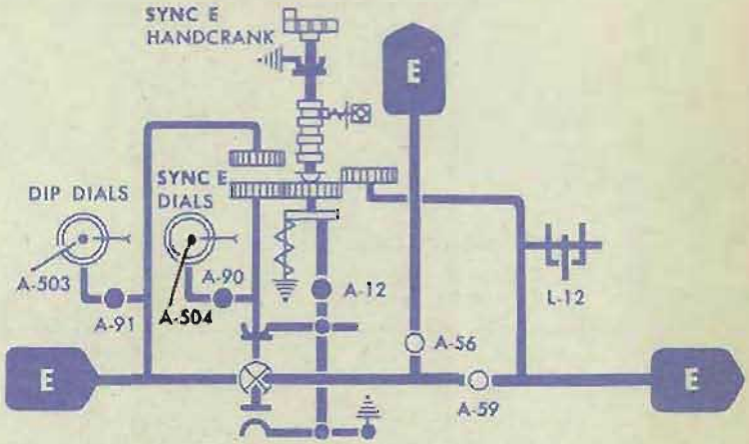
Set the index on the coarse dial at the fixed index. The index on the fine dial should also be at the fixed index.

Adjustment

If both dials cannot be set at the fixed index, bring the index on the fine dial to the fixed index by turning the sync *E* IN-position input gear.

Loosen A-504 and slip the coarse dial until the coarse index matches the fixed index and the fine dial graduation.

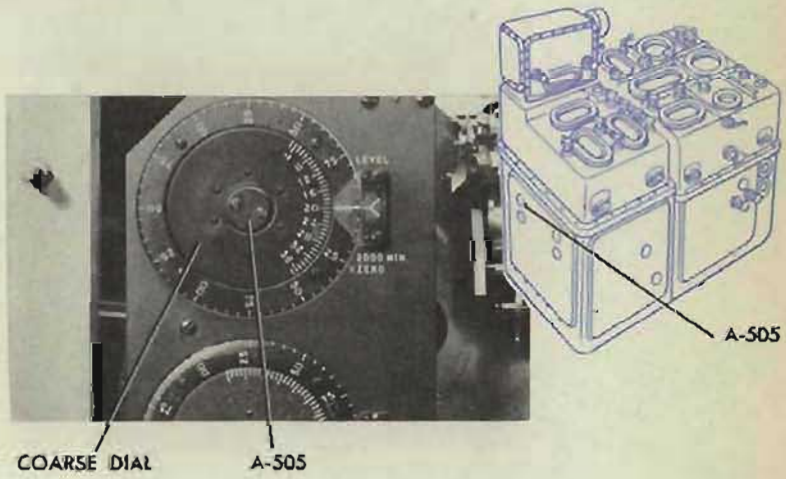
Tighten A-504, and recheck. Check A-90.



A-505 COARSE to FINE L DIAL

Location

A-505 is under cover 7, on the coarse *L* dial.



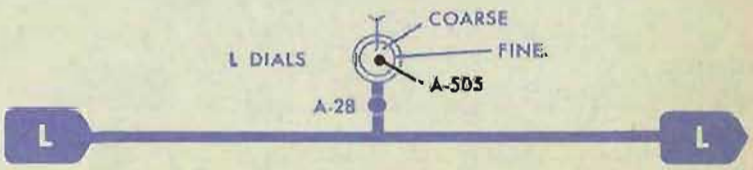
Check

Turn the *L* line at the stable element to set the computer *L* dials at 2000′. When the coarse dial reads 20, the fine dial should read 00.

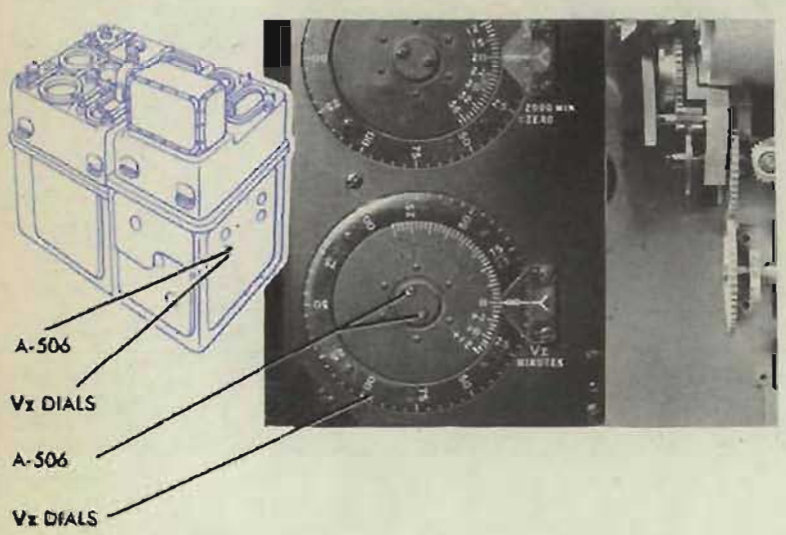
Adjustment

If the coarse dial does not read 20 when 00 on the fine dial matches the index, loosen A-505 and slip the coarse dial to 20.

Tighten A-505 and recheck. Check A-28.



A-506 COARSE to FINE Vz DIAL



Location

A-506 is under cover 7, on the coarse *Vz* dial.

Check

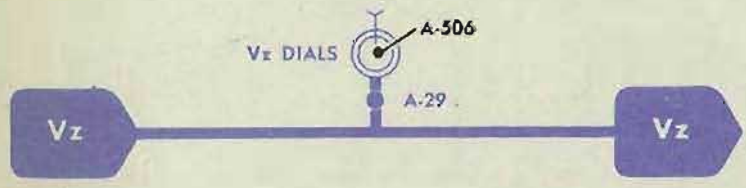
Turn the power OFF.

Set the 0 graduation on the coarse *Vz* dial at the fixed index by turning the output gearing on the *Vz* follow-up. The 00 graduation on the ring dial should be in line with the 0 graduation on the coarse dial and the fixed index.

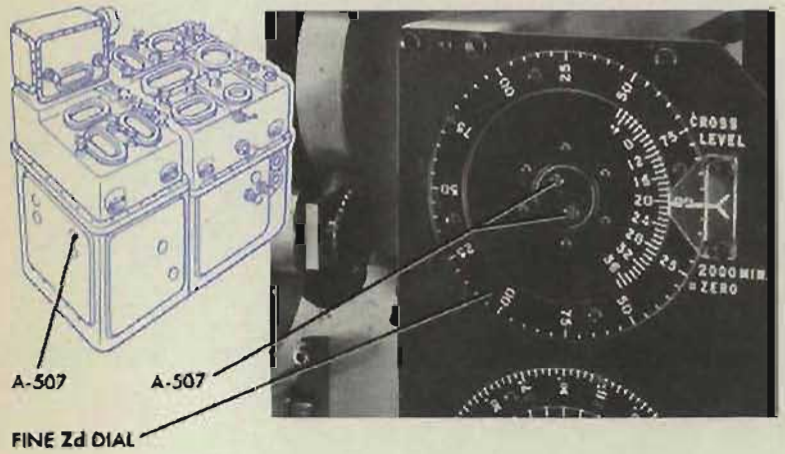
Adjustment

If the dial readings do not agree, bring the 00 reading on the fine *Vz* dial to the fixed index. Loosen A-506 and slip the 0 mark on the coarse *Vz* dial to the fixed index.

Tighten A-506, and recheck.
Check A-29.



A-507 COARSE to FINE Zd DIAL



Location

A-507 is under cover 7, on the coarse *Zd* dial.

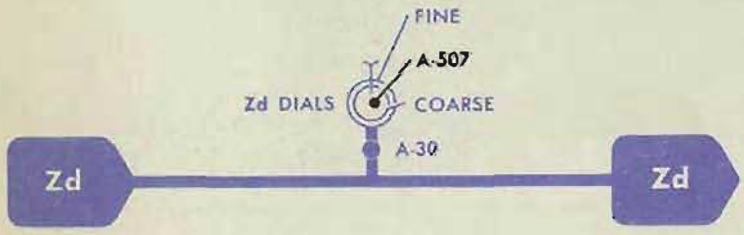
Check

Set the computer *Zd* dials at 2000′ by turning the *Zd* shaft line. When the fine dial is at 00, the coarse dial should read 20.

Adjustment

If the coarse *Zd* dial does not read 20, loosen A-507, and slip the coarse dial to 20.

Tighten A-507, and recheck.
Check A-30.



A-508 COARSE to FINE Dd DIAL

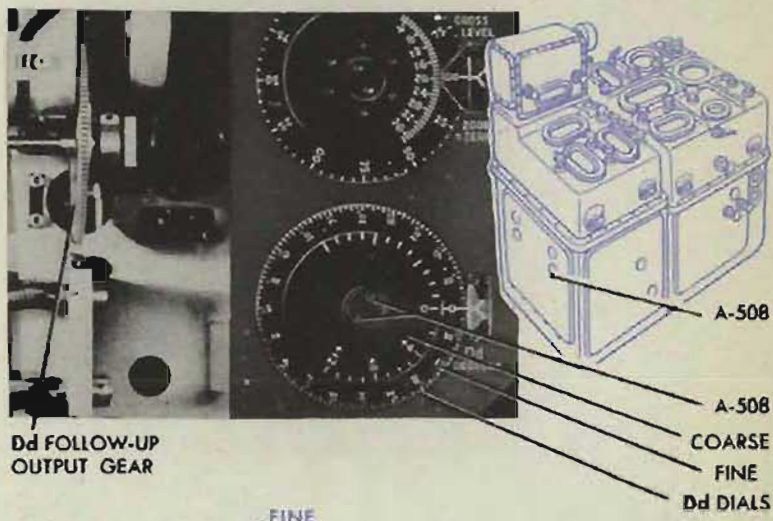
Location

A-508 is under cover 7, on the coarse *Dd* dial.

Check

Turn the power OFF.

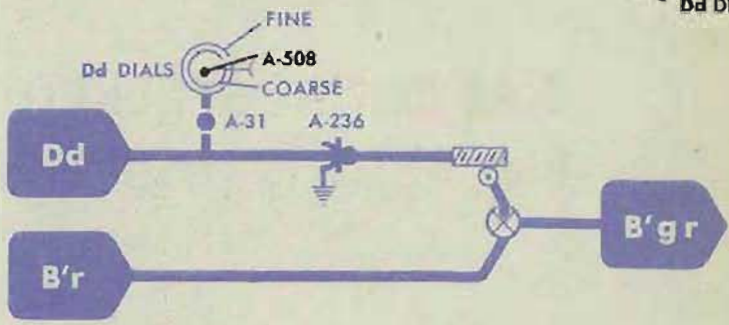
Set the *Dd* dials at 0 by turning the *Dd* follow-up output gearing.



Adjustment

If the coarse *Dd* dial does not read 0, when the fine dial reads 0 at the fixed index, loosen A-508 and slip the coarse dial to 0.

Tighten A-508, and recheck.
Check A-31.



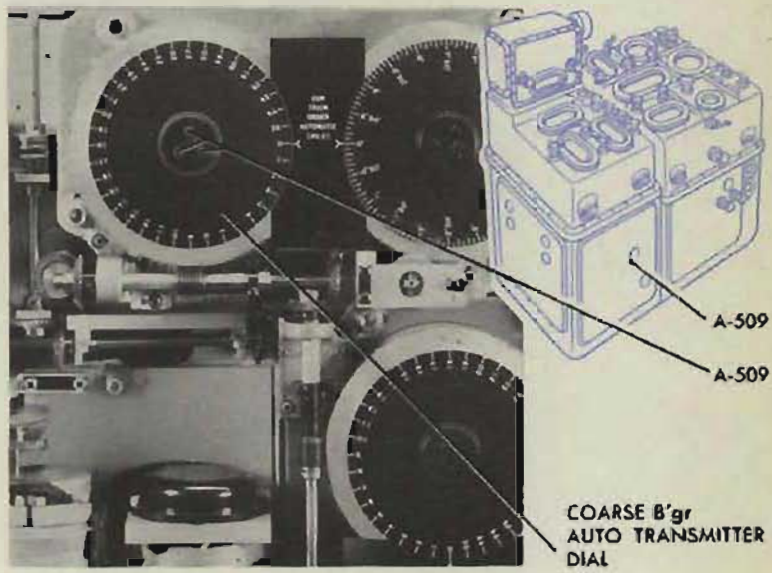
A-509 DIAL to COARSE SYNCHRO — B'gr AUTO TRANSMITTER

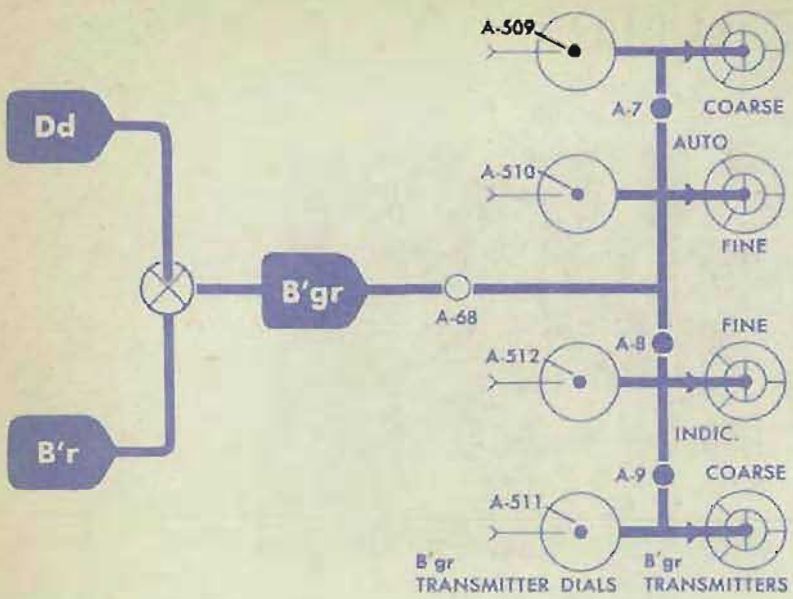
Location

A-509 is under cover 8, on the coarse *B'gr* automatic transmitter dial.

Check

Set the coarse *B'gr* automatic transmitter dial at 0°. The coarse *B'gr* automatic transmitter synchro should be on electrical zero.





Adjustment

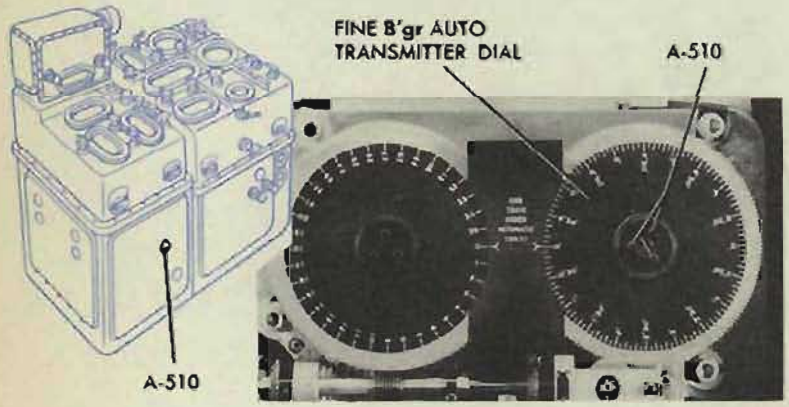
Set the coarse synchro of the transmitter on electrical zero.

Loosen A-509 and slip the dial to 0.

Tighten A-509, and recheck.

Check A-7.

A-510 DIAL to FINE SYNCHRO — B'gr AUTO TRANSMITTER

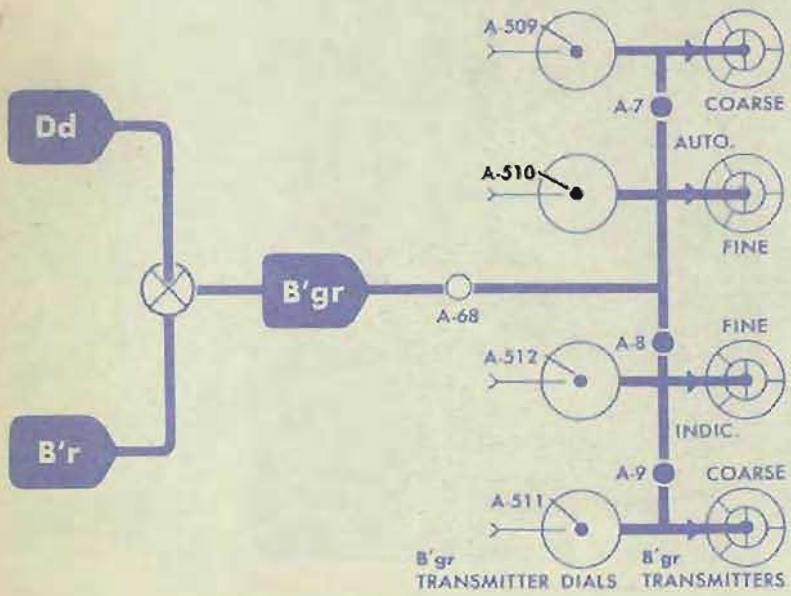


Location

A-510 is under cover 8, on the fine *B'gr* automatic transmitter dial.

Check

Set the fine *B'gr* automatic transmitter dial at 0°. The fine *B'gr* automatic transmitter synchro should be on electrical zero.



Adjustment

Set the fine synchro of the *B'gr* automatic transmitter on electrical zero.

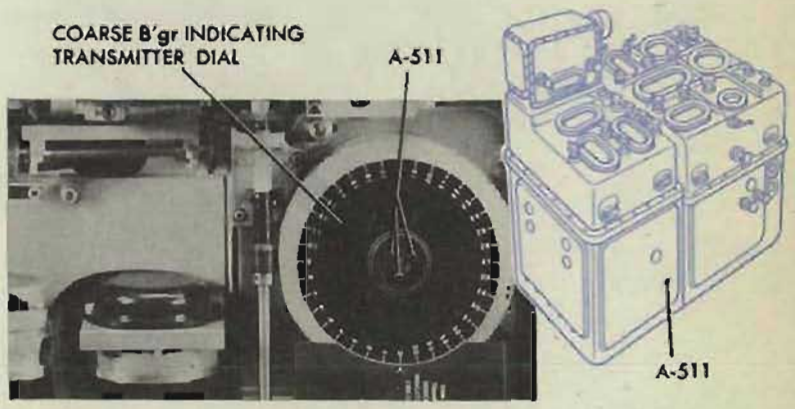
Loosen A-510, and slip the dial to 0°.

Tighten A-510, and recheck.
Check A-7.

A-511 DIAL to COARSE SYNCHRO — B'gr INDICATING TRANSMITTER

Location

A-511 is under cover 8, on the coarse *B'gr* indicating transmitter dial.



Check

Set the coarse *B'gr* indicating transmitter dial at 0°. The coarse *B'gr* indicating transmitter synchro should be on electrical zero.

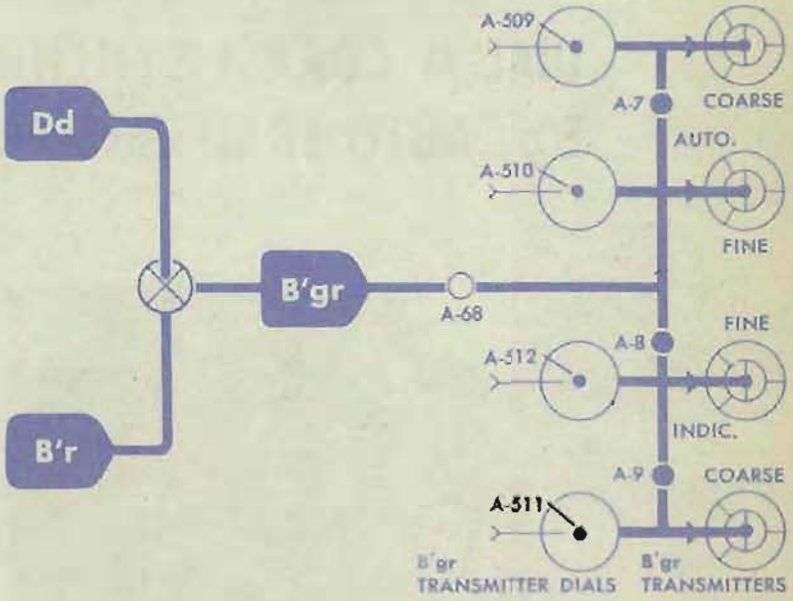
Adjustment

Set the coarse synchro of the *B'gr* indicating transmitter on electrical zero.

Loosen A-511, and slip the dial to 0°.

Tighten A-511, and recheck.

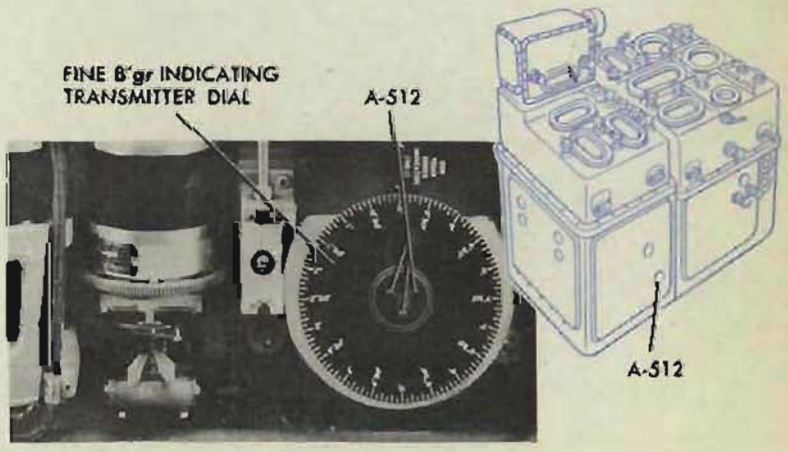
Check A-9.



A-512 DIAL to FINE SYNCHRO — B'gr INDICATING TRANSMITTER

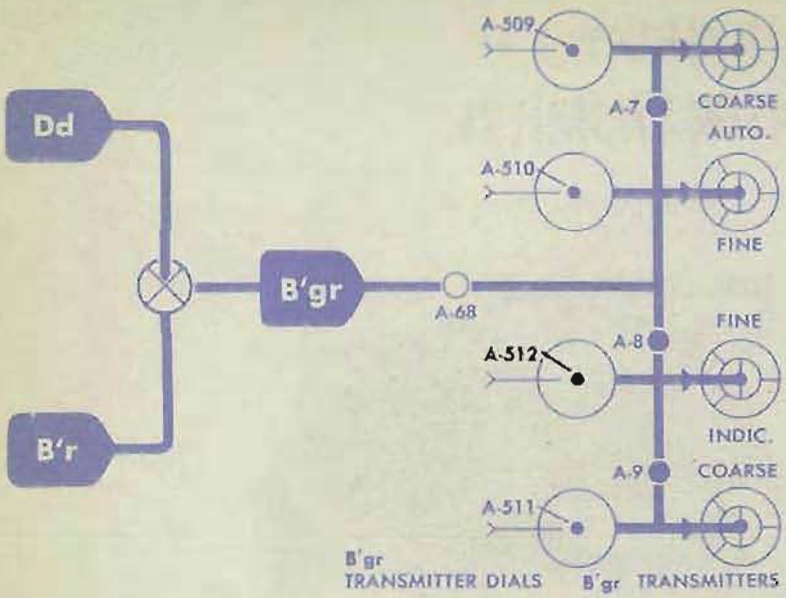
Location

A-512 is under cover 8, on the fine *B'gr* indicating transmitter dial.



Check

Set the fine *B'gr* indicating transmitter dial at 0°. The fine *B'gr* indicating transmitter synchro should be on electrical zero.



Adjustment

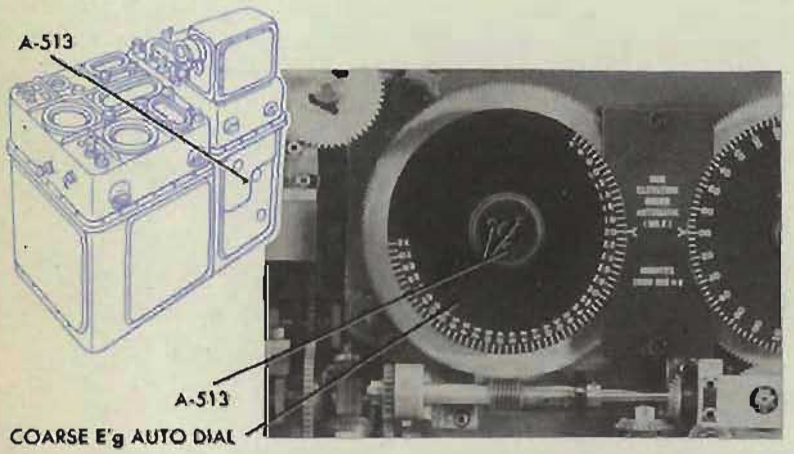
Set the fine synchro of the *B'gr* indicating transmitter on electrical zero.

Loosen A-512, and slip the dial to 0°.

Tighten A-512, and recheck.

Check A-9.

A-513 DIAL to COARSE SYNCHRO — E'g AUTO TRANSMITTER

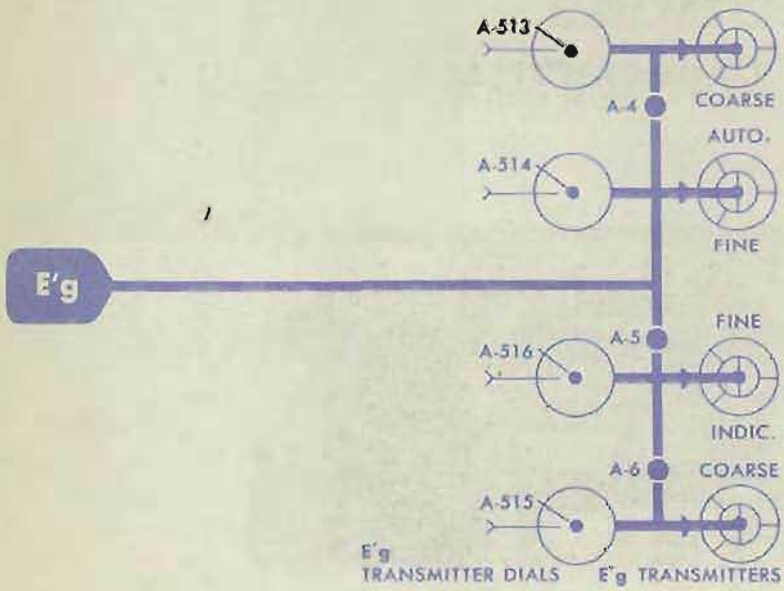


Location

A-513 is under cover 6, on the coarse *E'g* auto transmitter dial.

Check

Set the coarse synchro of the *E'g* auto transmitter on electrical zero. The coarse dial should read 20.



Adjustment

If the coarse *E'g* dial does not read 20 when the coarse synchro is at electrical zero, loosen A-513 and slip the dial to the correct reading.

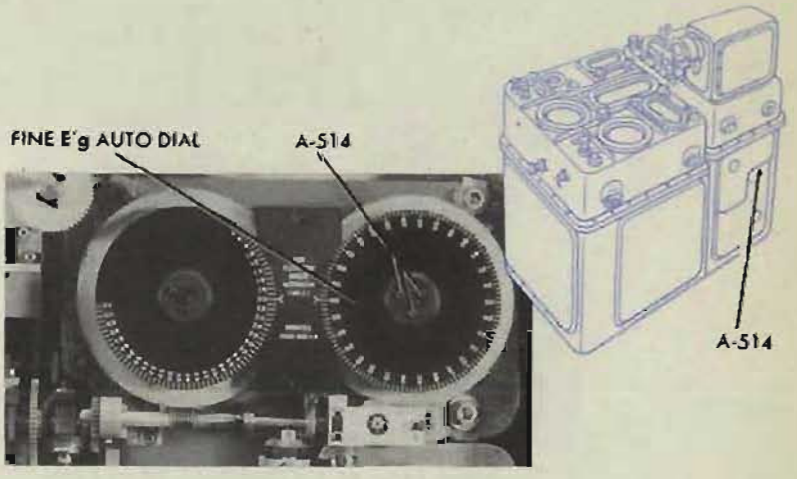
Tighten A-513, and recheck.

Check A-4.

A-514 DIAL to FINE SYNCHRO — E'g AUTO TRANSMITTER

Location

A-514 is under cover 6, on the fine *E'g* automatic transmitter dial.



Check

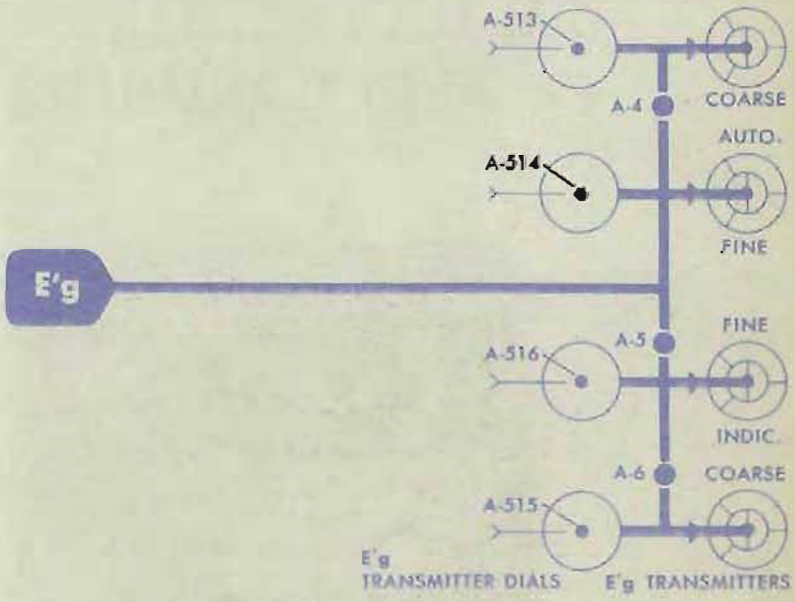
Set the fine synchro of the *E'g* automatic transmitter on electrical zero. The fine dial should read 00.

Adjustment

If the fine *E'g* auto dial does not read 00, loosen A-514 and slip the dial to 00.

Tighten A-514, and recheck.

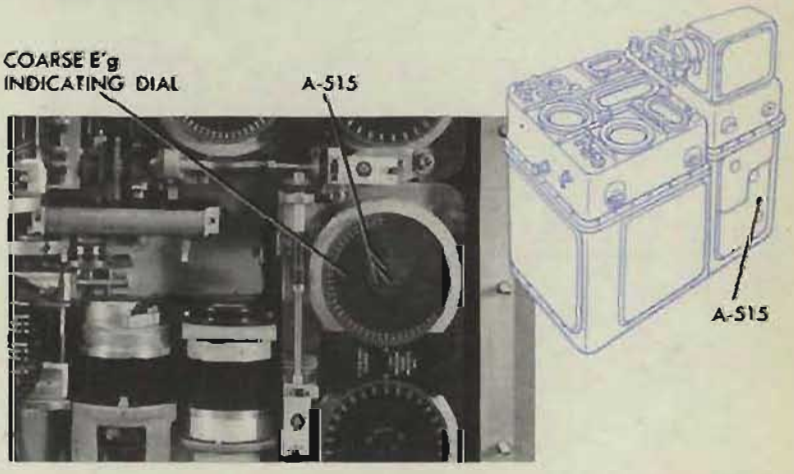
Check A-4.



A-515 DIAL to COARSE SYNCHRO — E'g INDICATING TRANSMITTER

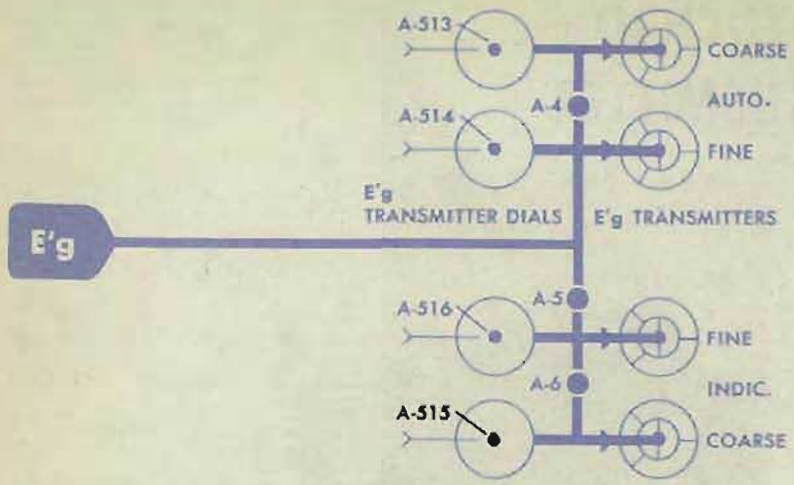
Location

A-515 is under cover 6, on the coarse *E'g* indicating transmitter dial.



Check

Set the coarse synchro of the *E'g* indicating transmitter on electrical zero. The coarse *E'g* indicating dial should read 20.



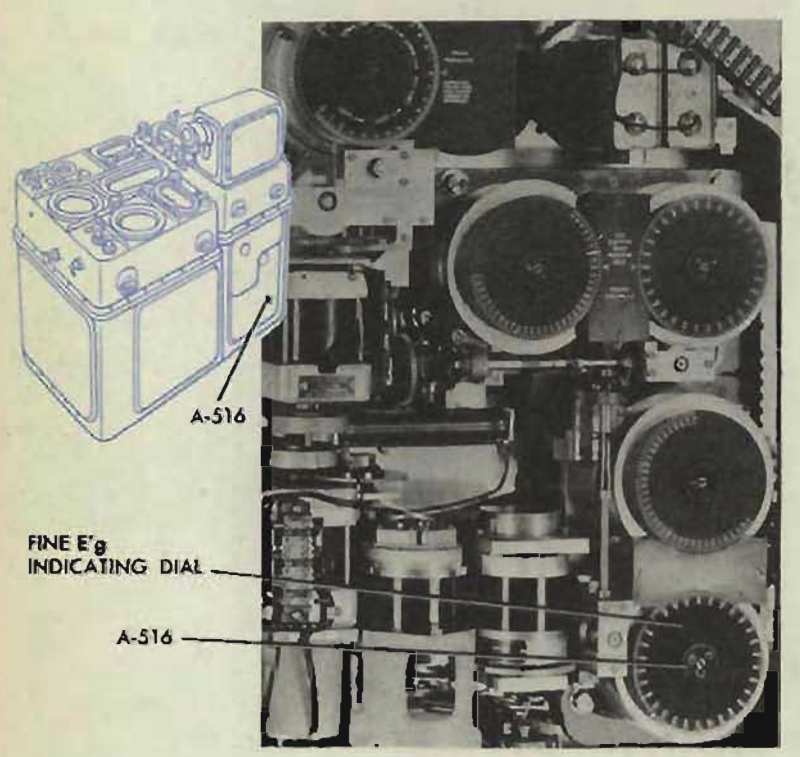
Adjustment

Set the coarse synchro of the transmitter at electrical zero. If the coarse *E'g* indicating dial does not read 20, loosen A-515 and slip the *E'g* dial to 20.

Tighten A-515, and recheck.

Check A-6.

A-516 DIAL to FINE SYNCHRO — E'g INDICATING TRANSMITTER

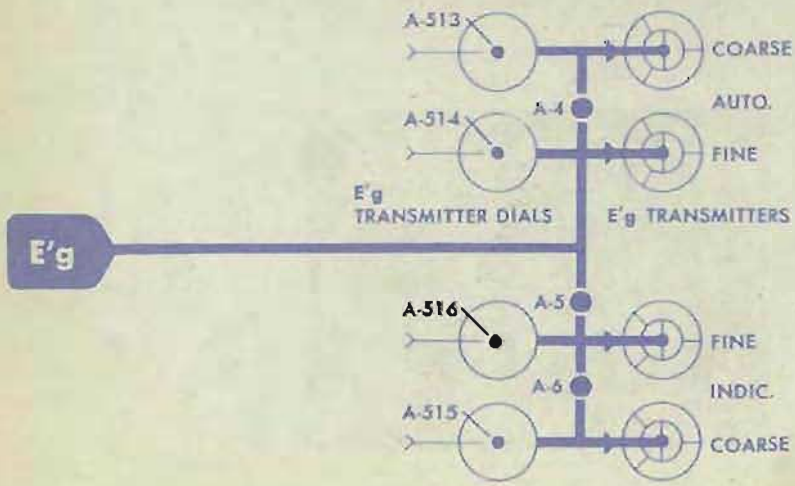


Location

A-516 is under cover 6, on the fine *E'g* indicating transmitter dial.

Check

Set the fine synchro of the transmitter on electrical zero. The fine *E'g* indicating dial should read 00.



Adjustment

Set the fine synchro on electrical zero. If the fine indicating *E'g* dial does not read 00, loosen A-516 and slip the dial to 00.

Tighten A-516, and recheck.

Check A-6.

A-517 DIAL to SYNCHRO — Ph TRANSMITTER

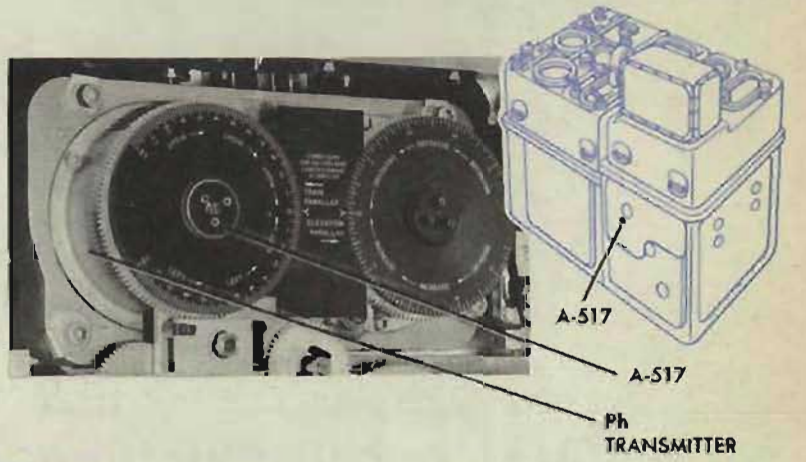
Location

A-517 is under cover 6, on the *Ph* transmitter dial.

Check

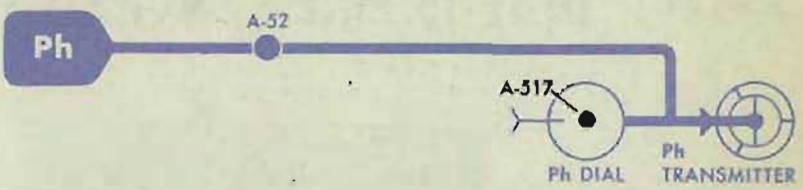
Loosen A-52.

Set the synchro of the *Ph* transmitter on electrical zero. The *Ph* dial should read 0°.



Adjustment

If the *Ph* dial does not read 0°, loosen A-517 and slip the *Ph* dial to its proper value.
Tighten A-517, and recheck.
Readjust A-52.



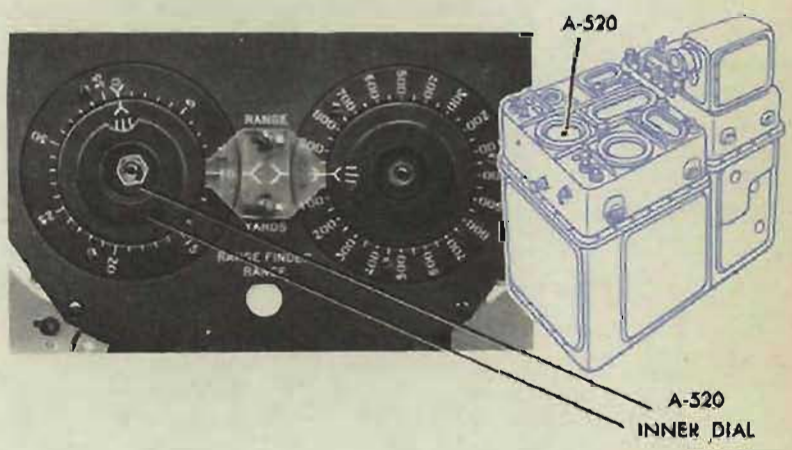
A-520 DIAL to COARSE SYNCHRO — R RECEIVER

Location

A-520 is under cover 1, on the coarse synchro of the *R* receiver.

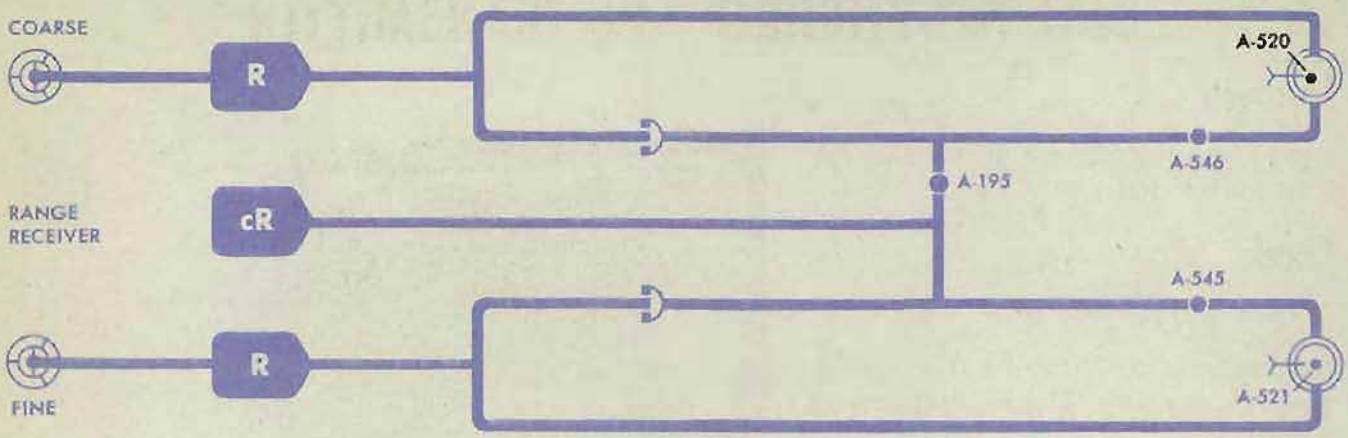
Check

Transmit 10,000 yards range from the director. Check that there is torque on the synchro rotor by trying to turn the inner dial.
Turn the range rate control switch to MANUAL.
Set the coarse ring dial at 10,000 yards.
The index on the inner dial should match the 0 index on the ring dial.

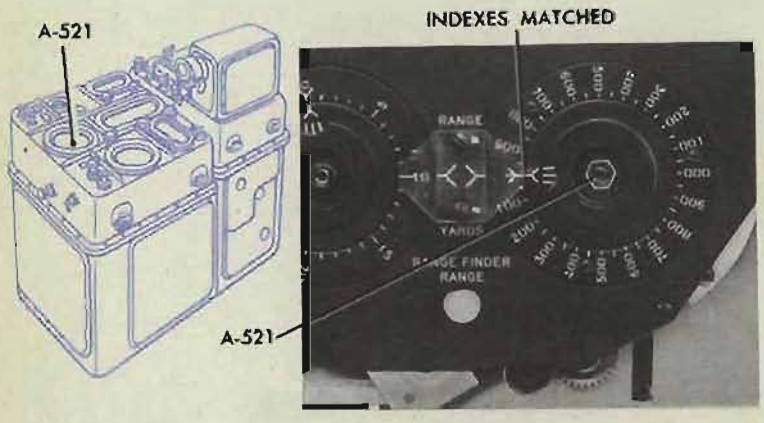


Adjustment

If the index on the inner dial does not match the index on the ring dial, loosen A-520 with a synchro dial wrench. Move the inner dial until it matches.
Tighten A-520, and recheck.
Check A-521, A-546, and A-195.



A-521 DIAL to FINE SYNCHRO — R RECEIVER



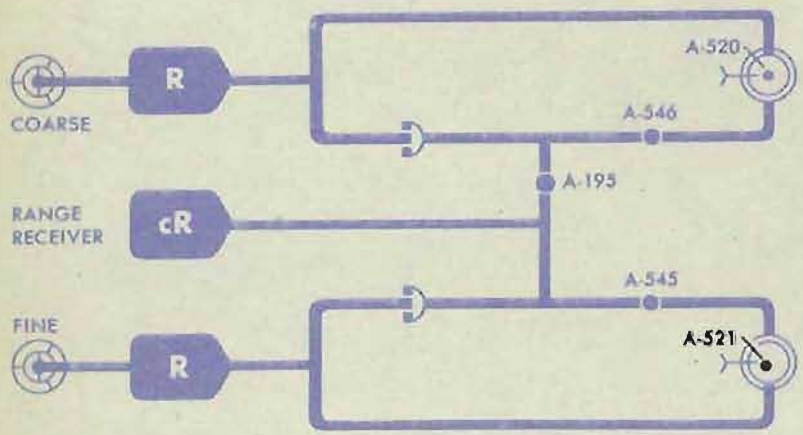
Location

A-521 is under cover 1, on the fine synchro of the *R* receiver.

Check

Transmit 10,000 yards range from the director.
Turn the range rate control switch to MANUAL.
Set the fine range ring dial index at the fixed index.

The index on the fine inner dial should match the index on the ring dial.



Adjustment

If the indexes do not match, loosen A-521 with a synchro dial wrench. Move the inner dial until the indexes match.

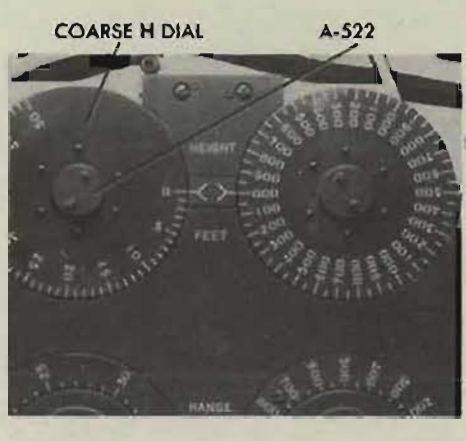
Tighten A-521, and recheck.

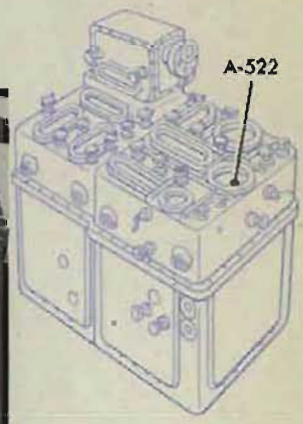
Check A-545.

A-522 COARSE H DIAL to HEIGHT COMPUTER

Location

A-522 is under cover 1, on the coarse *H* dial.





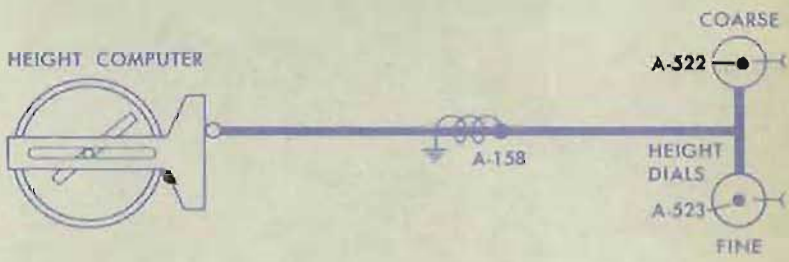
Check

Set E at 0°.
Set *cR* at 0 yards.
The coarse *H* dial should read 0 feet.

Adjustment

If the coarse *H* dial does not read 0, loosen A-522 and slip the dial to 0.

Tighten A-522, and recheck.



A-523 FINE H DIAL to HEIGHT COMPUTER

Location

A-523 is under cover 1, on the fine *H* dial.

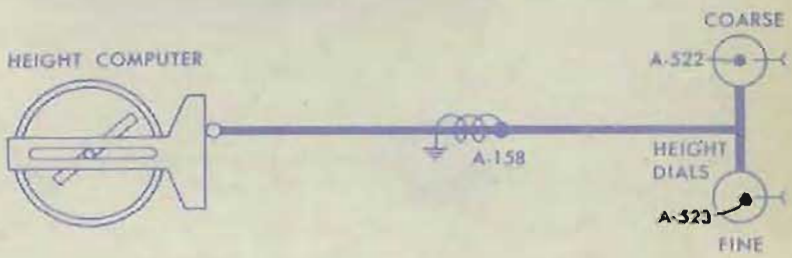
Check

Set *cR* at 0 yards.
Set *E* at 0°.
The fine *H* dial should read 000.

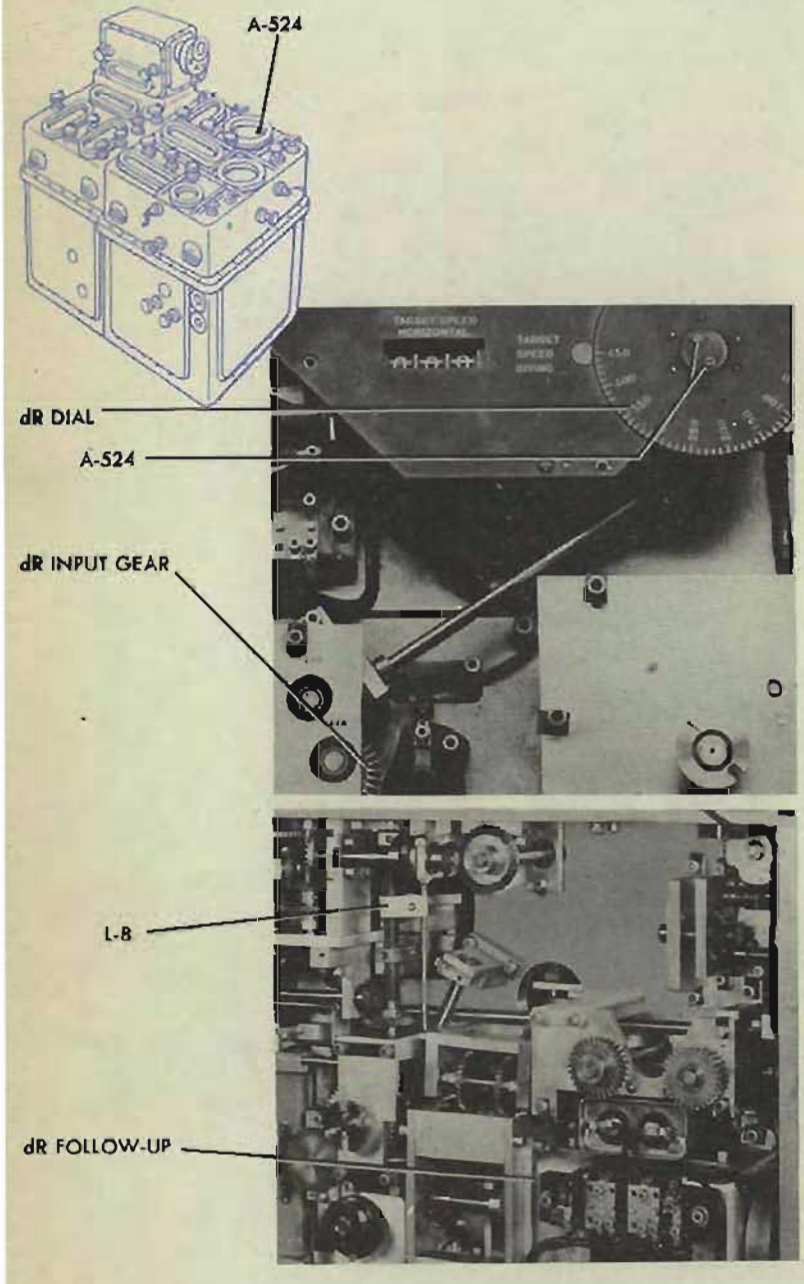
Adjustment

If the fine *H* dial does not read 000, loosen A-523 and slip the dial to 000.

Tighten A-523, and recheck.



A-524 dR DIAL to L-8



Location

A-524 is under cover 1, on the *dR* dial.

L-8 is under cover 1, above the gearing on the *dR* follow-up. It is mounted vertically, with the lower limit at the bottom.

Check

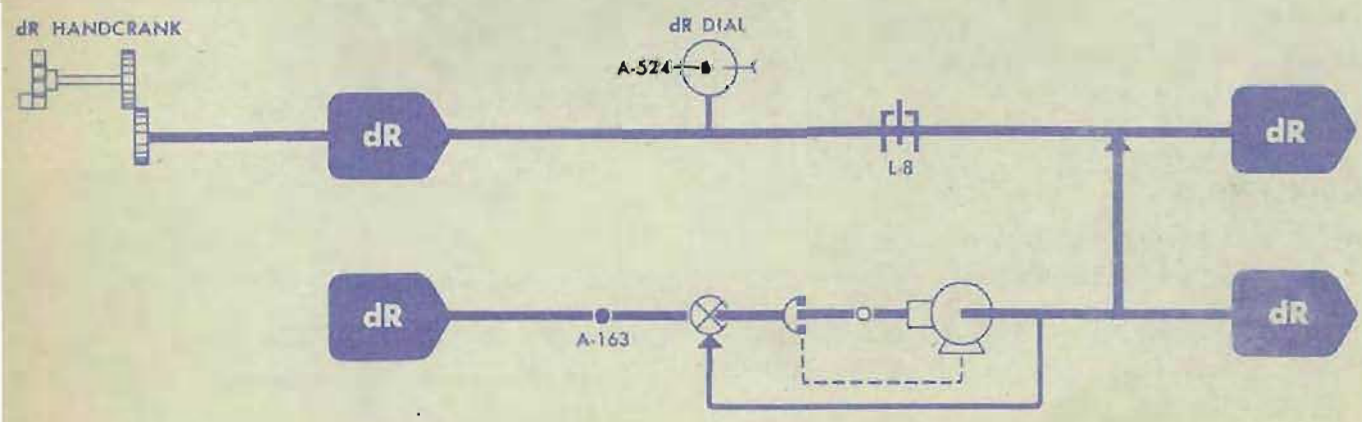
Turn the power OFF.

Turn *dR* until L-8 reaches the lower limit. The *dR* dial should read −450 on the inscribed side of the dial.

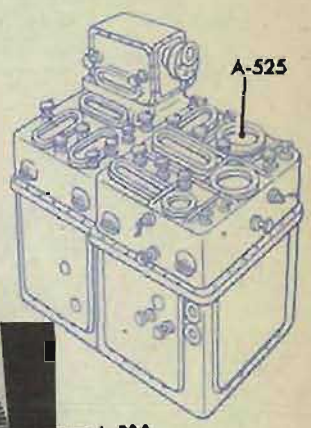
Adjustment

If the dial does not read the proper value, loosen A-524.
Hold the *dR* line against the stop and slip the *dR* dial to −450 knots.
Tighten A-524 and recheck at the upper limit. The *dR* dial should read +450 knots on the blank side of the dial.

Check A-163.



A-525 dH DIAL to L-4



Location

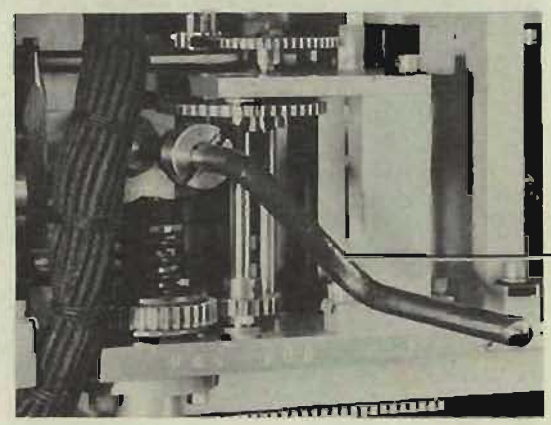
A-525 is under cover 1, on the *dH* dial.

L-4 is under cover 1 on the underside of the top plate. Its lower limit is toward the left.

Check

Run the *dH* line by hand to either limit.

At the upper limit, the *dH* dial should read CLIMB 150, and at the lower limit it should read DIVE 250.



Note

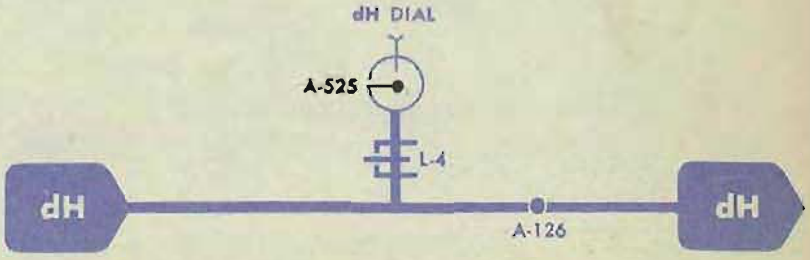
If either limit of L-4 cannot be reached, A-126 may be causing a restriction. If so, loosen and readjust it later.

Adjustment

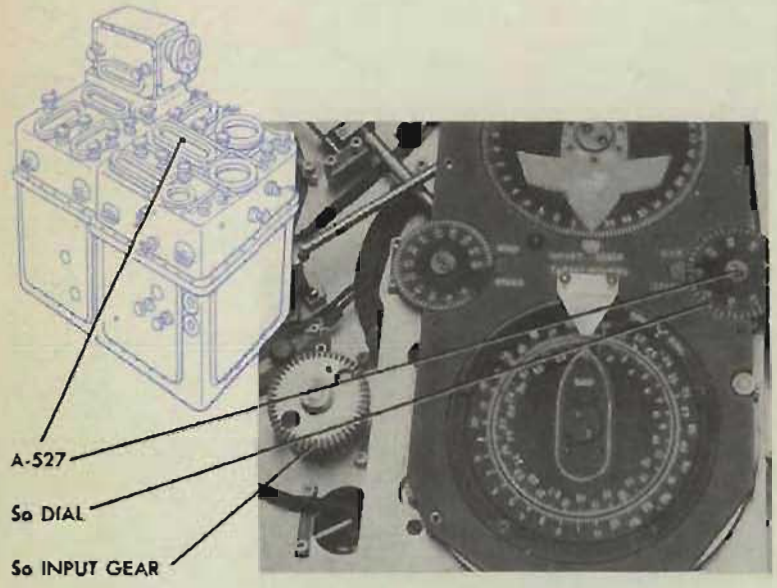
If the *dH* dial does not read the proper value at its limits, loosen A-525.
Hold the *dH* line against either limit and slip the *dH* dial to the proper value.
Tighten A-525, making sure that the *dH* line is held against the stop.

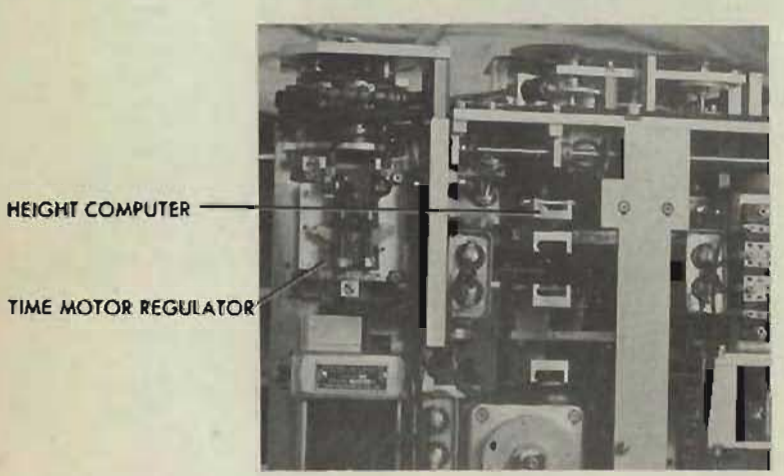
Recheck at the other limit of L-4.

Check A-126.



A-527 So DIAL to L-1





Location

A-527 is under cover 1, on the *So* dial.

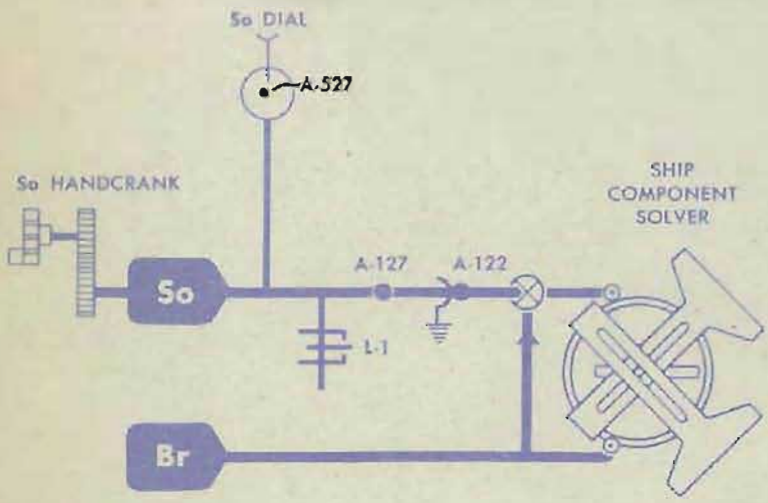
L-1 is under cover 1, to the right of the ship dial group, under the top plate. It may be seen through the opening to the rear of the time motor regulator, above the height computer.

Check

The *So* dial should read 0 knots at the lower limit and 45 knots at the upper limit.

CAUTION

If any restriction is felt in the line before either limit is reached, loosen A-127 and readjust it later.



Adjustment

If the *So* dial does not read 0 knots at the lower limit and 45 knots at the upper limit, loosen A-527. Turn the *So* input gear to hold the line against the lower limit. Slip the dial to 0.

Tighten A-527, and recheck at the upper limit.

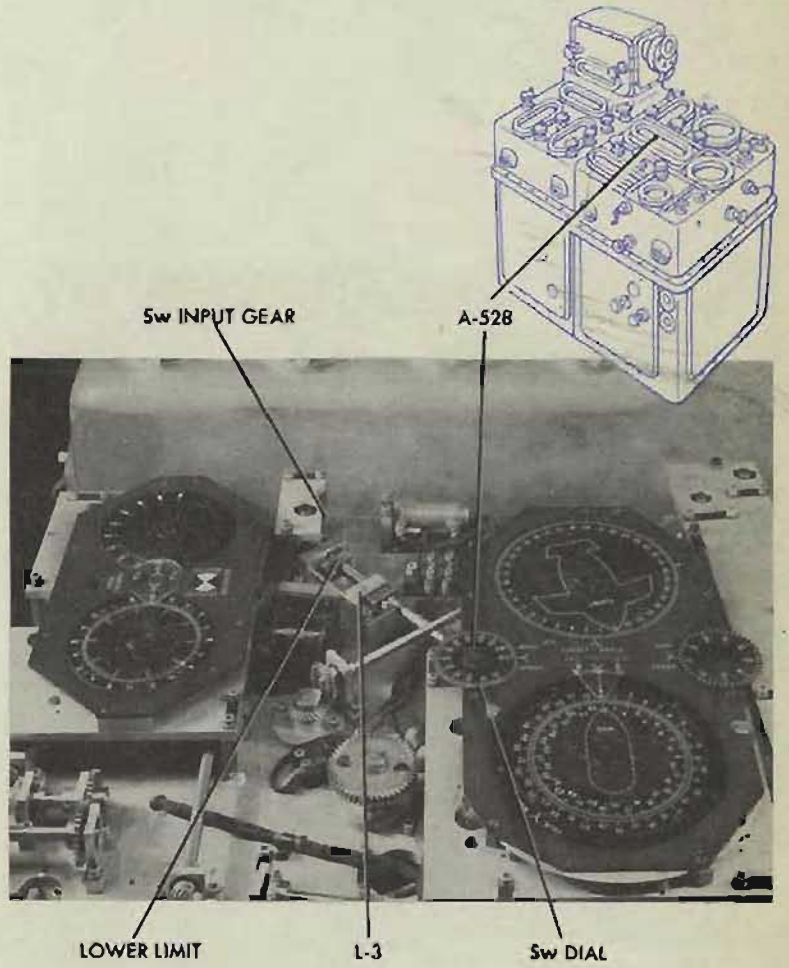
Check A-127 and A-212.

A-528 Sw DIAL to L-3

Location

A-528 is under cover 1, on the *Sw* dial.

L-3 is near the *Sw* input gear with its lower limit toward the input gear.



Check

The limits for *Sw* are 0 and 60 knots.

Turn the *Sw* input gear until the lower limit of the stop is reached. The *Sw* dial should read 0 knots.

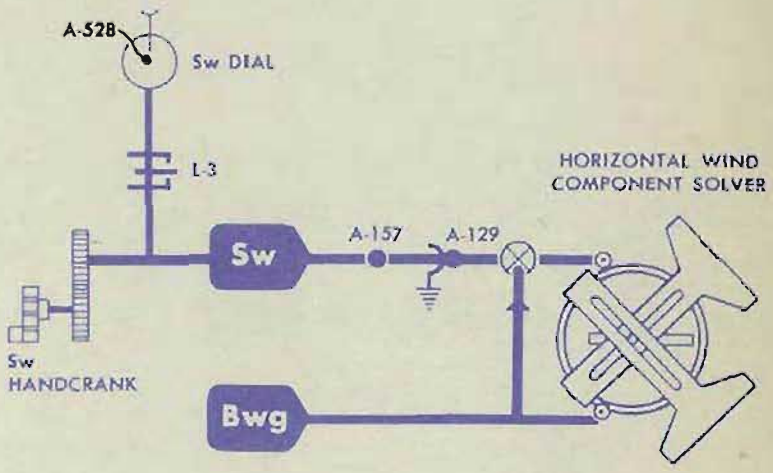
CAUTION

If either end of the limit stop cannot be reached, A-157 may be upset and causing a restriction. Loosen A-157, and readjust it later.

Adjustment

If the *Sw* dial does not read 0 knots when the stop is at its lower limit, loosen A-528. Hold the line against the stop and slip the dial to 0.

Tighten A-528.

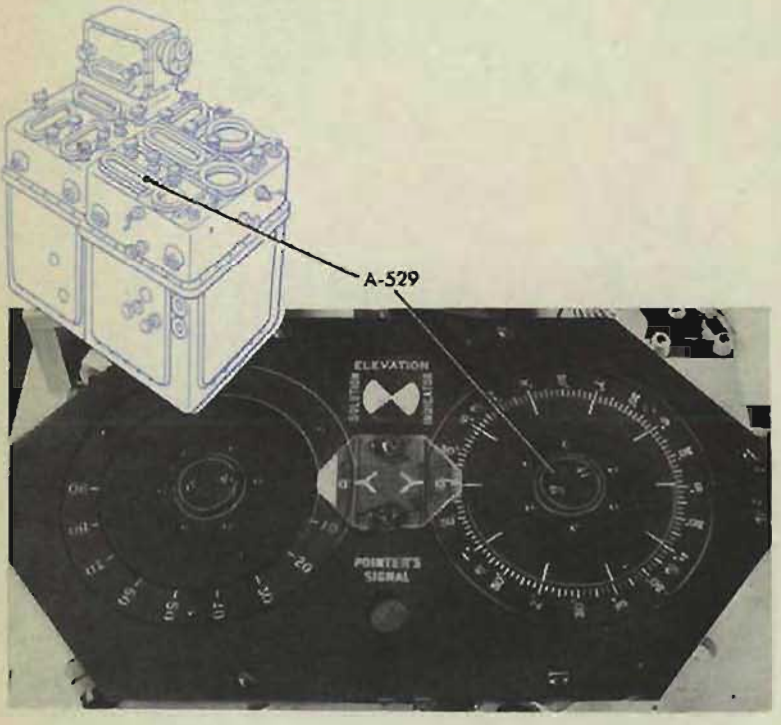


Recheck

Run *Sw* to the upper limit. The *Sw* dial should read 60 knots.

Check A-157.

A-529 FINE cE DIAL to FINE E DIAL



Location

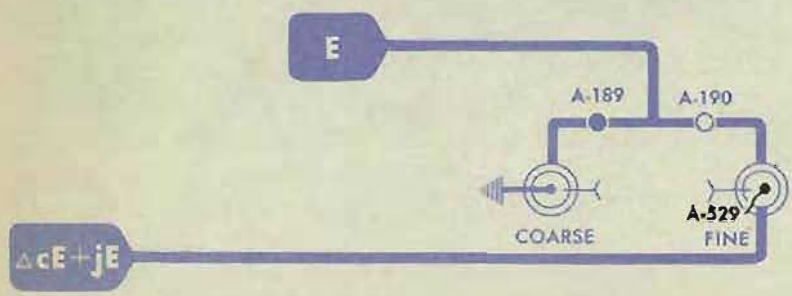
A-529 is under cover 1, on the fine *cE* dial.

Check

Set *E* at 0°.
Turn the power ON.
Turn the control switch to AUTO.
One index on the fine *cE* dial should match the fixed index, within ± 4 minutes.

On Ser. Nos. 100 and lower, the pointer should match the fixed index, within ± 4 minutes.

NOTE: The tolerance of ± 4 minutes allows for the wide contact spacing on the *jE* follow-up.



Adjustment

If one *cE* index, or the pointer, does not match the fixed index, loosen A-529, and slip the dial to the matched position. (Split the 8 minutes' dead space.)

Tighten A-529 and recheck.

A-530 COARSE cE DIAL to COARSE E DIAL

Location

A-530 is under cover 1, on the coarse *cE* dial, on instruments with Ser. Nos. 100 and lower.

Check

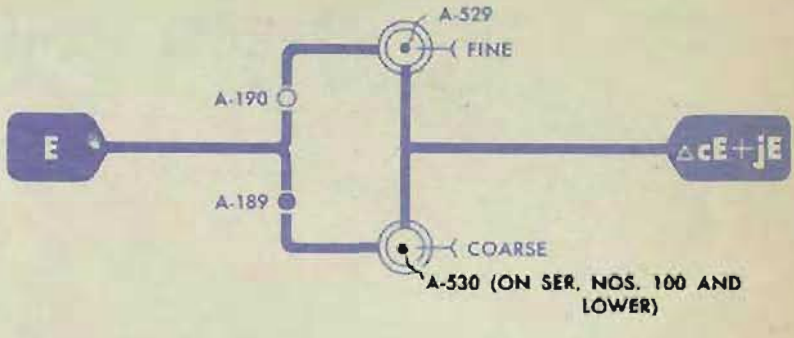
Set *E* at 0°.
Turn the power ON.
Turn the control switch to AUTO.
One graduation on the coarse inner dial should match the 0 of the ring dial.

Adjustment

If one graduation does not match the 0 of the ring dial loosen A-530.

Slip the dial to the matched position.

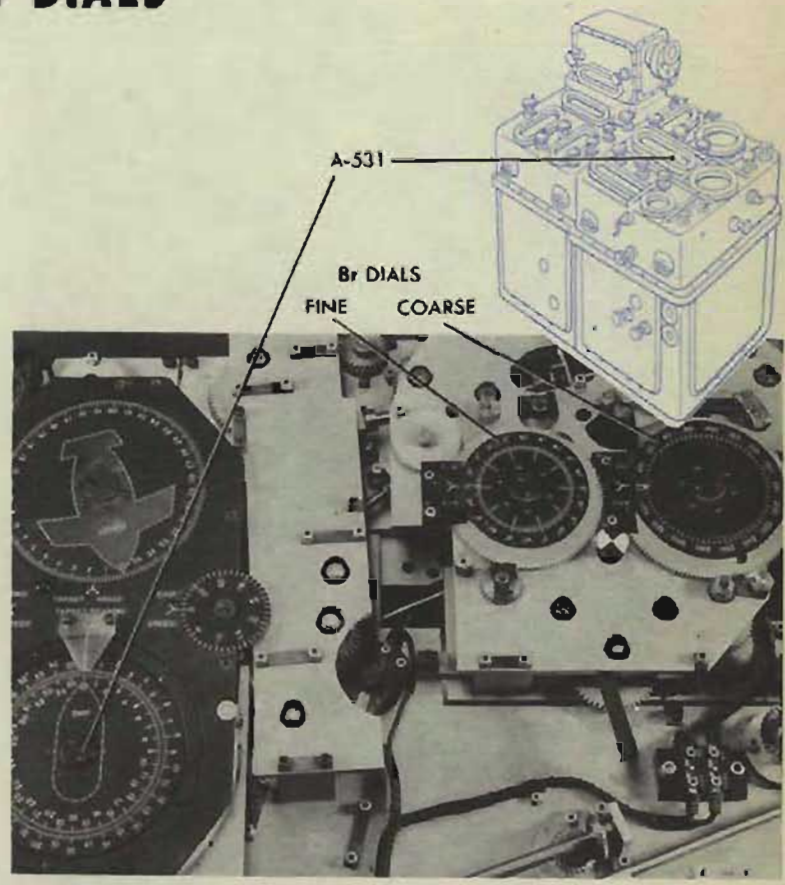
Tighten A-530, and recheck.



A-531 SHIP DIAL to Br DIALS

Location

A-531 is under cover 1, on the ship dial.



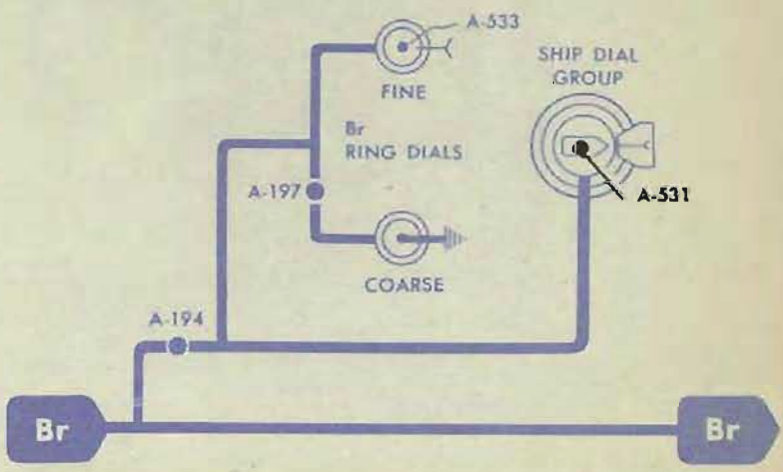
Check

Turn the power ON.
Set *Br* at 0°.
The ship dial should read 0° at the fixed index when the *Br* dials read 0°.

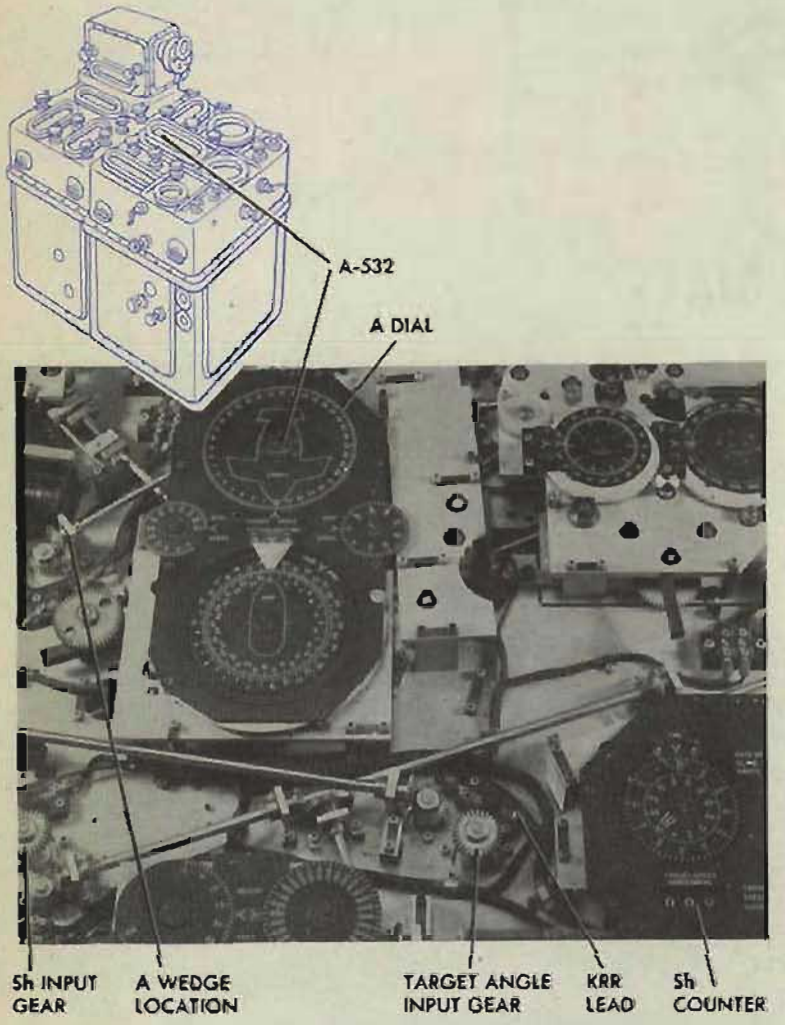
Adjustment

If the ship dial does not read 0°, wedge the *Br* line at 0° and loosen A-531. Slip the ship dial to read 0°.

Tighten A-531 and recheck by moving *Br* off 0° and bringing it back on. Observe whether the ship dial readings continuously match the *Br* dial readings.



A-532 A DIAL to TARGET COMPONENT SOLVER



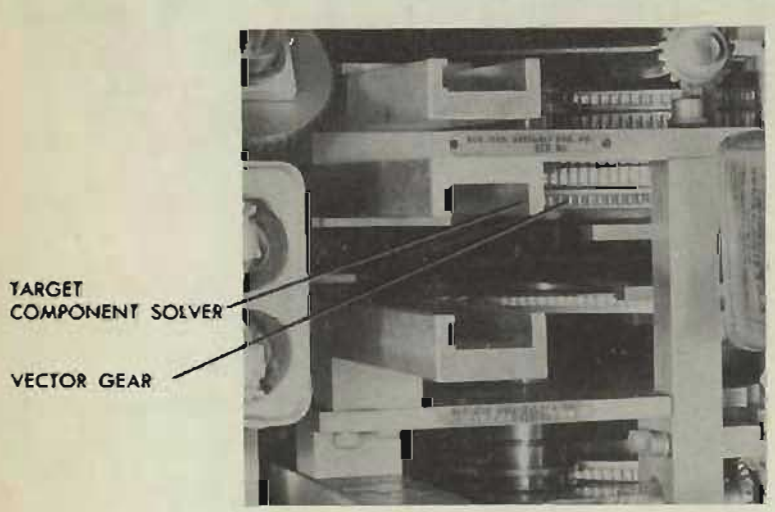
Location

A-532 is under cover 1, on the *A* dial.

Check

Disconnect the KRR lead on the target angle push-button switch.
Turn the power ON.
Set *A* at 0°, and wedge the input gear.
The vector gear slot of the target component solver should be toward the front.

The vector gear can be seen through an access at the right side of the front top section, in front of the *RdBs* follow-up. The target component solver is the second component solver from the top.



Set *Sh* at 0 knots.

Mark the *RdBs* follow-up output gear for use as an indicator.

Run *Sh* from 0 to 400 knots.

The follow-up indicator marks should remain matched for full travel of *Sh*.

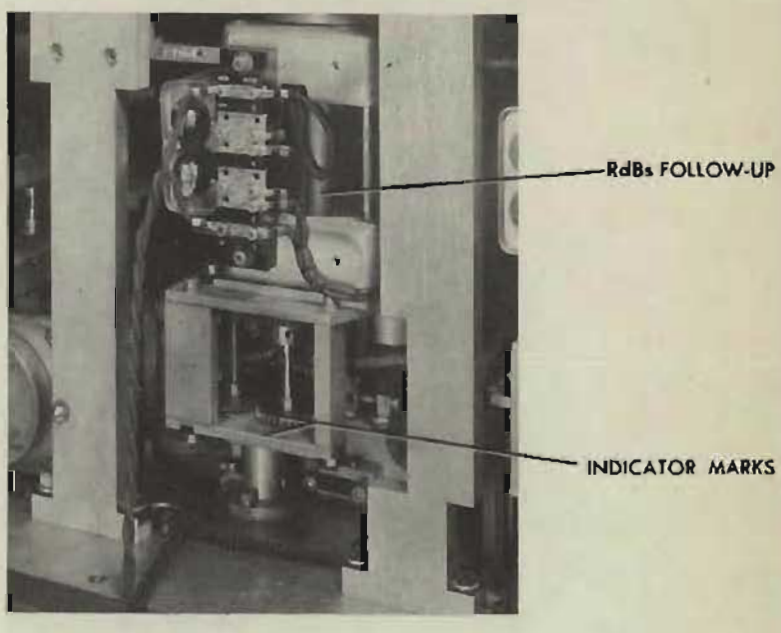
Adjustment

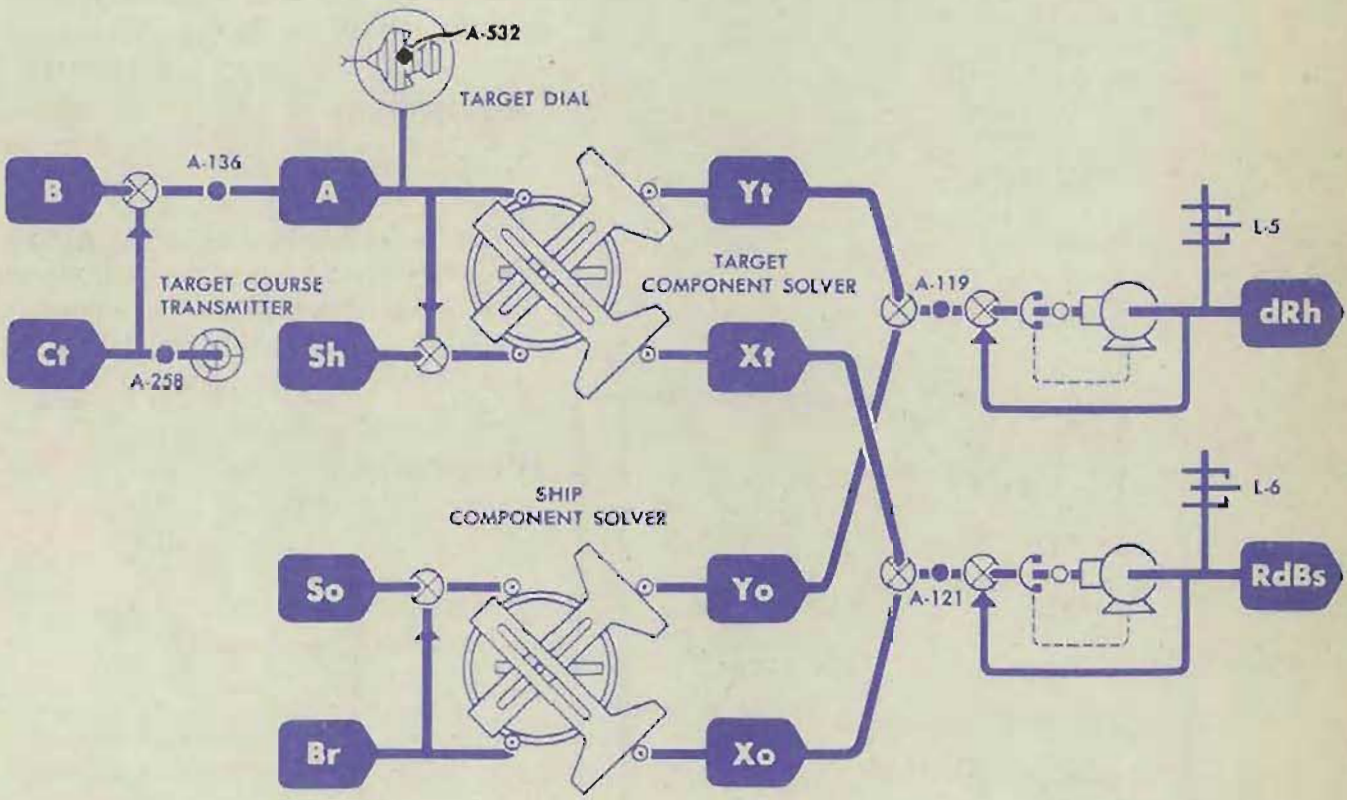
If the marks do not remain matched, remove the wedges from the *A* line and turn the *A* input until the marked gear has returned to its original position.

When the error is corrected, wedge the *A* line.

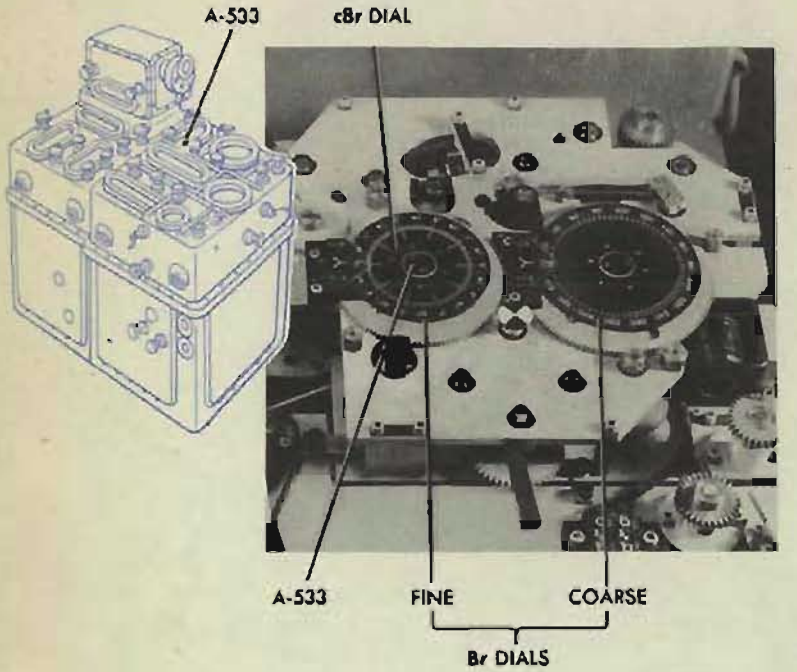
Loosen A-532 and set the *A* dial at 0°.
Tighten A-532 and recheck. The final error should be less than one-half-tooth movement of the indicating gear. Turn *A* to 180° and repeat the check, splitting any lost motion.
Remove all wedges, and replace the KRR lead.

Check A-119, A-121, A-136, and A-258.





A-533 FINE cBr DIAL to FINE Br DIAL



Location

A-533 is under cover 1, on the fine *cBr* dial.

Check

Turn the power ON.
Set *Br* at 0°.
Turn the control switch to AUTO.
One of the index marks of the fine *cBr* dial should match the 0° graduation of the fine *Br* dial, within ± 7 minutes.

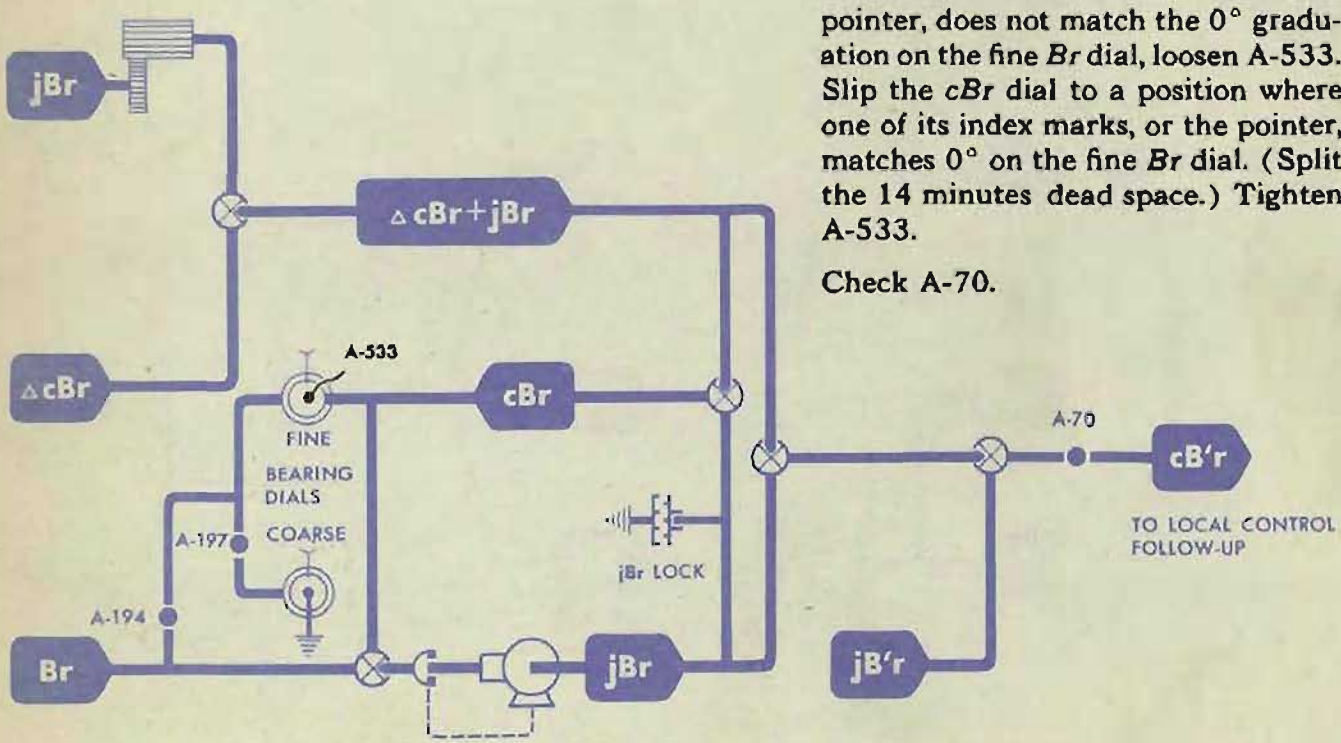
On instruments with Ser. Nos. 100 and lower, the pointer should match the 0° graduation of the ring dial within ± 7 minutes.

NOTE: The tolerance of ± 7 minutes allows for the wide contact spacing on the *jBr* follow-up.

Adjustment

If one of the *cBr* index marks, or the pointer, does not match the 0° graduation on the fine *Br* dial, loosen A-533. Slip the *cBr* dial to a position where one of its index marks, or the pointer, matches 0° on the fine *Br* dial. (Split the 14 minutes dead space.) Tighten A-533.

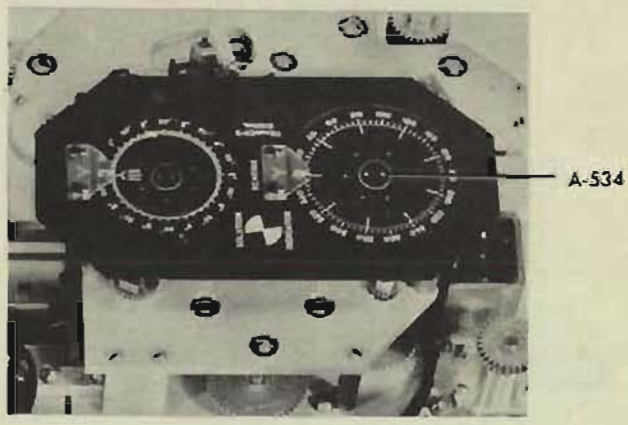
Check A-70.



A-534 COARSE cBr DIAL to COARSE Br DIAL

Location

A-534 is under cover 1, on the coarse *cBr* dial, on instruments with Ser. Nos. 100 and lower.

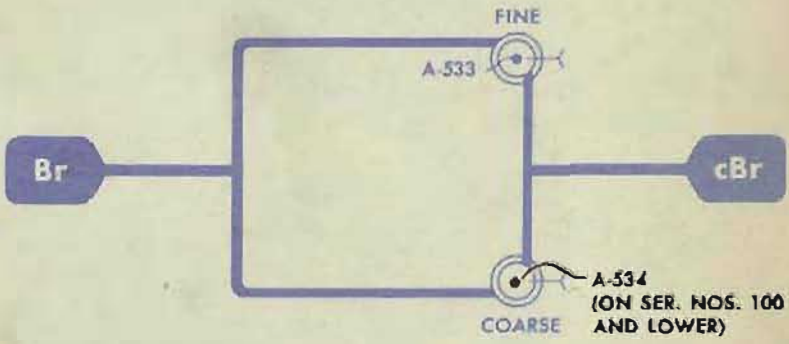


Check

Turn the power ON.
Set *Br* at 0°.
Turn the control switch to AUTO.
One graduation of the coarse inner dial should match the 0 of the ring dial.

Adjustment

If one graduation does not match the 0 of the ring dial, loosen A-534.
Slip the dial to the correct position.
Tighten A-534, and recheck.



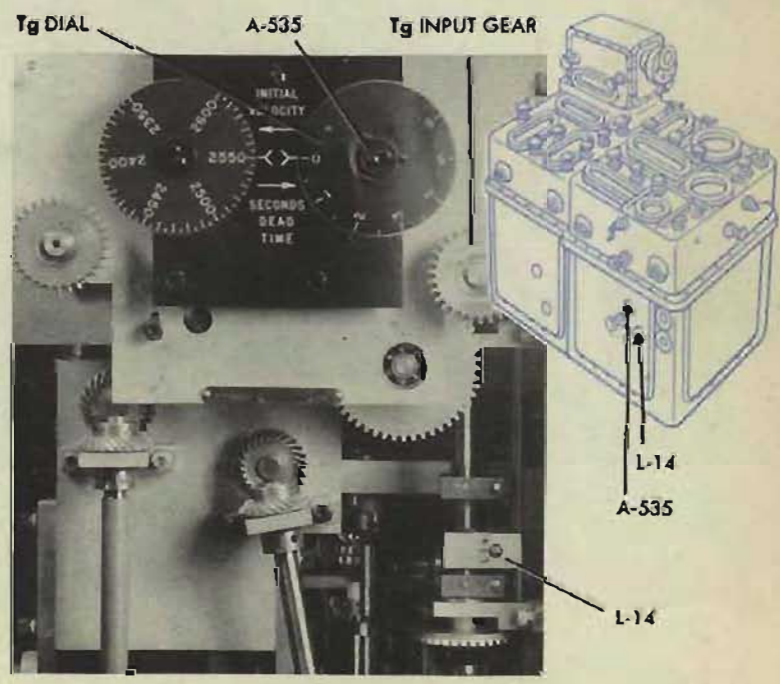
A-535 Tg DIAL to L-14, or L-38

Location

A-535 is under cover 3, on the *Tg* dial.

L-14 is below the *Tg* input gear, in a vertical position with its lower limit at the bottom.

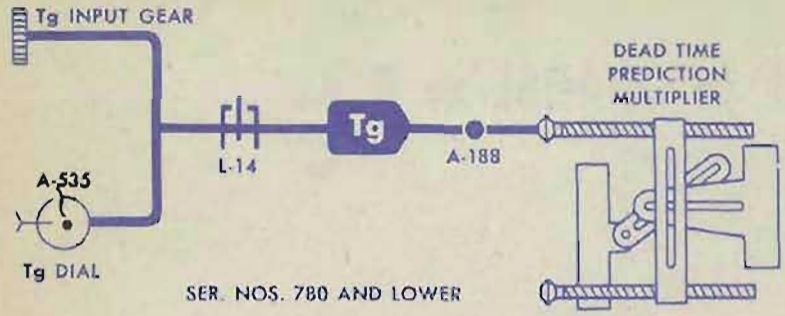
L-38 is on a spur gear behind the *Tg* dial, on Ser. Nos. 781 and higher.

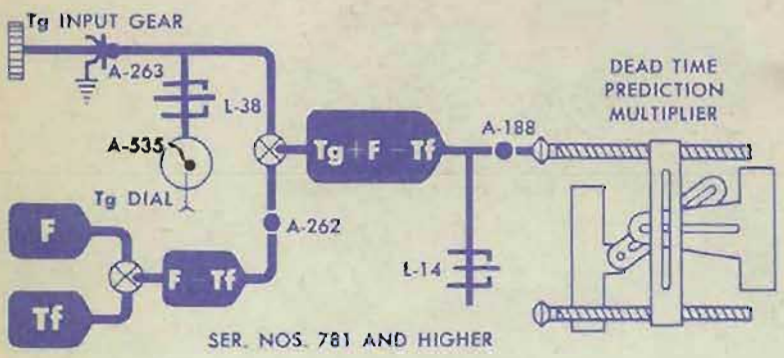


Check

The *Tg* dial should read 0 seconds at the lower limit and 6 seconds at the upper limit.

Turn the *Tg* input gear and read the limit values on the *Tg* dial.





CAUTION

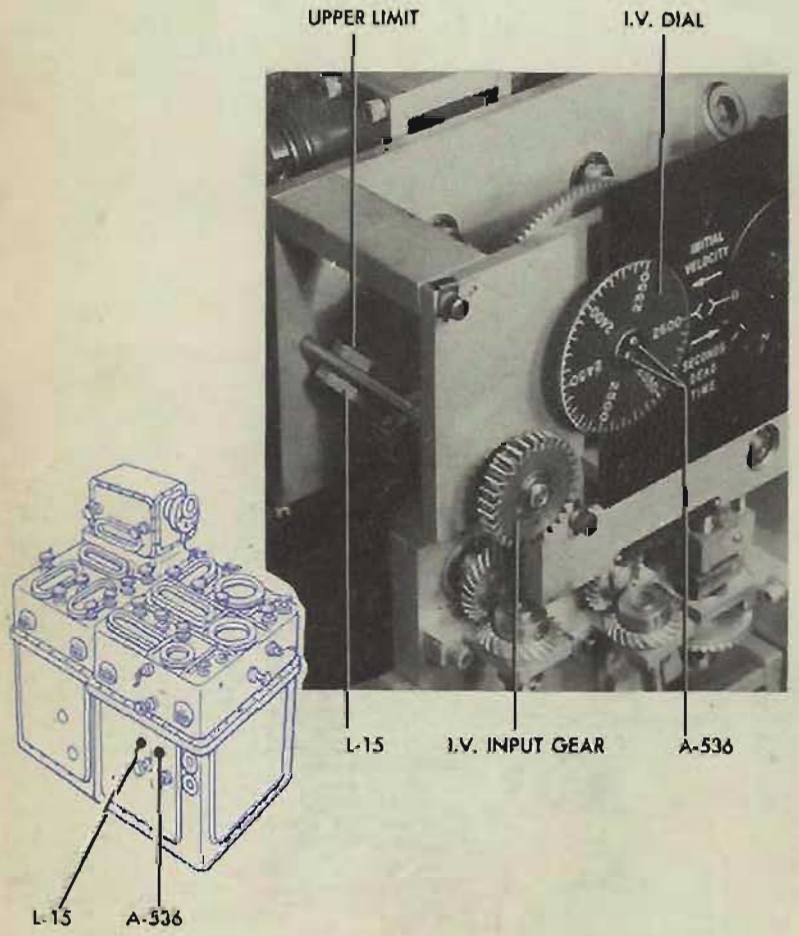
If either limit cannot be reached, loosen A-188.

Adjustment

If the *Tg* dial does not read the proper values, hold the line against the lower limit, loosen A-535, and slip the *Tg* dial to 0.
Tighten A-535, and recheck at the upper limit.

Check A-188 and A-262.

A-536 I. V. DIAL to L-15



Location

A-536 is under cover 3, on the *I.V.* dial.

L-15 is under cover 3, behind the *I.V.* input gear. The upper limit is at the inner end.

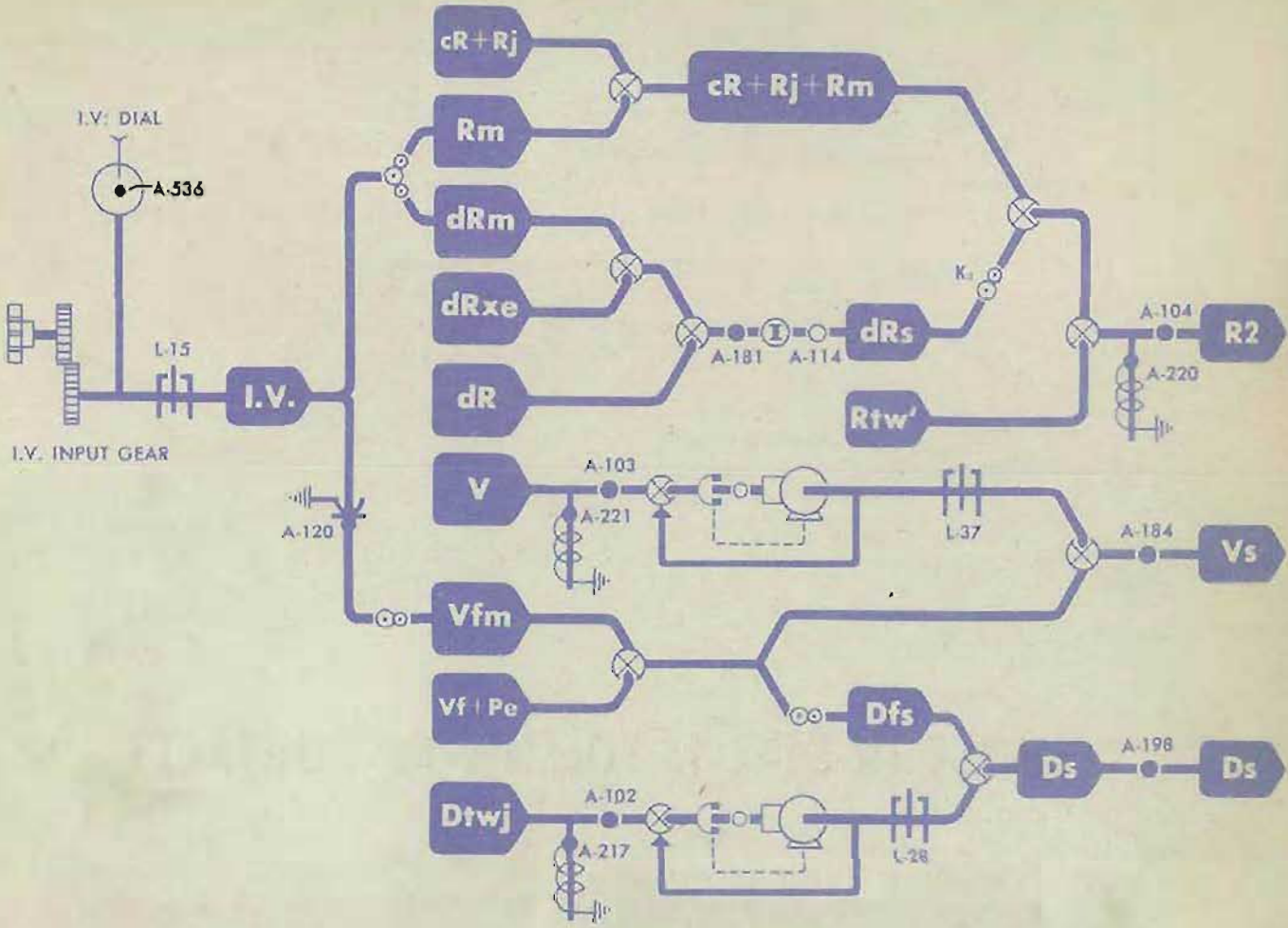
Check

On most instruments the limits are 2350 f.s. and 2600 f.s.
On Mods 8 and 12, the limits are 2400 and 2650 f.s.
Turn *I.V.* to each limit. If the *I.V.* dial reads incorrectly, readjust A-536.

Adjustment

Loosen A-536.
Hold the *I.V.* line against one limit and slip the dial to the correct value.
Tighten A-536, and recheck at the other limit.

Check A-102, A-103, A-104, A-181, A-198 and A-184.
On instruments with Ser. Nos. 781 and higher, also check A-132.



A-545 FINE cR DIAL to FOLLOW-UP CONTACTS

Location

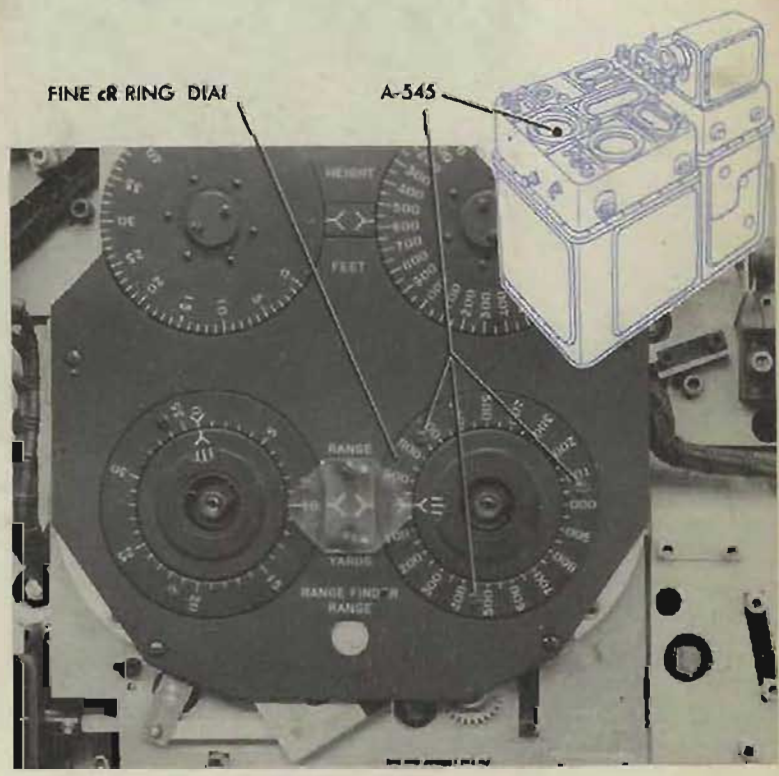
A-545 is under cover 1, on the fine *cR* ring dial.

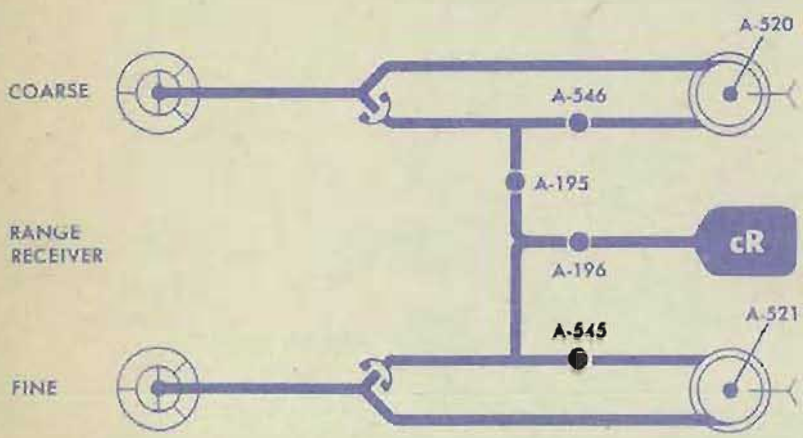
Check

Transmit 10,000 yards range from the director.
Keep the range finder's signal button depressed.
Turn the power ON.
Turn the range rate control switch to AUTO.
The index of the fine ring dial should match the index of the fine inner dial.

Adjustment

If the index of the fine *cR* ring dial does not match the index of the fine inner dial, loosen A-545 and slip the ring dial until the indexes match.

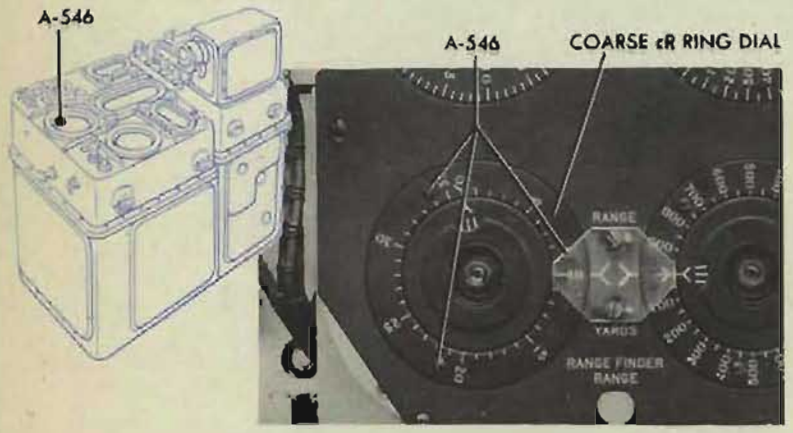


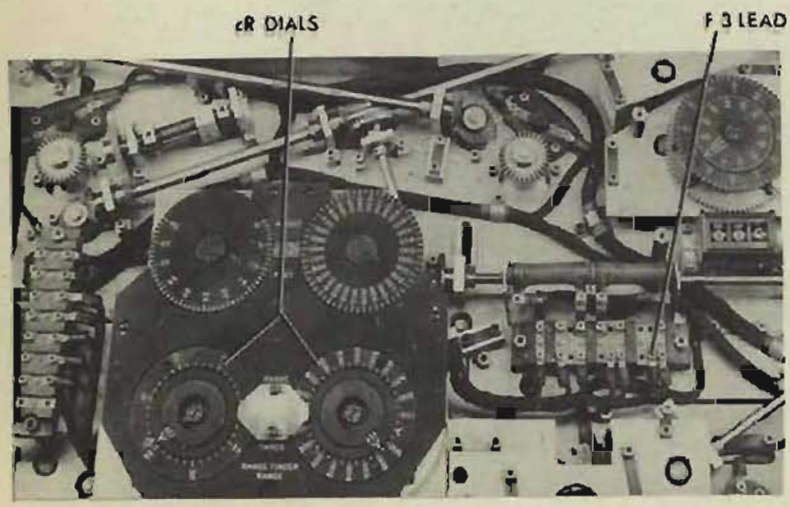


Tighten A-545 and recheck.

Check A-195 and A-521.

A-546 COARSE cR DIAL to FOLLOW-UP CONTACTS





Location

A-546 is under cover 1, on the coarse *cR* ring dial.

Check

Transmit 10,000 yards range from the director.

Keep the range finder's signal button depressed.
Turn the power ON.
Turn the range rate control switch to AUTO.

Disconnect the F3 fine control lead from the terminal block at the right of the *cR* dials.

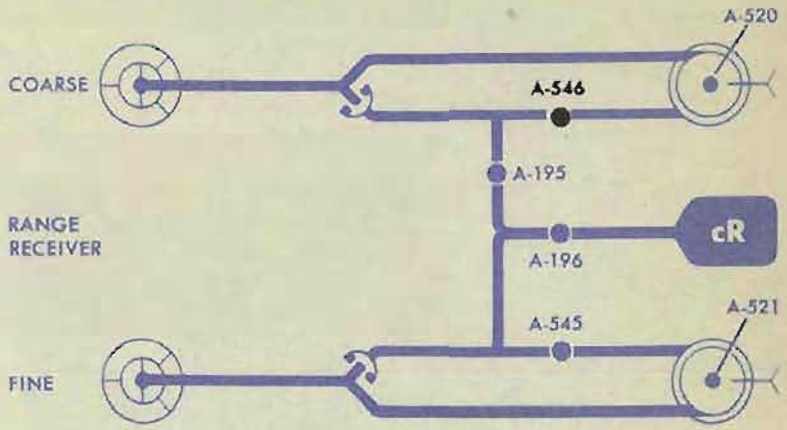
Turn *cR* until the *jdR* follow-up opposes further travel. Read *cR*.

Turn *cR* in the opposite direction until the *jdR* follow-up opposes further travel. Again read *cR*.

With *cR* at the midpoint between the two readings, the index on the coarse ring dial should match the index on the coarse inner dial.

Adjustment

If the indexes do not match at the midpoint of the dead space, loosen A-546 and slip the ring dial until they do match.



Tighten A-546, and recheck.

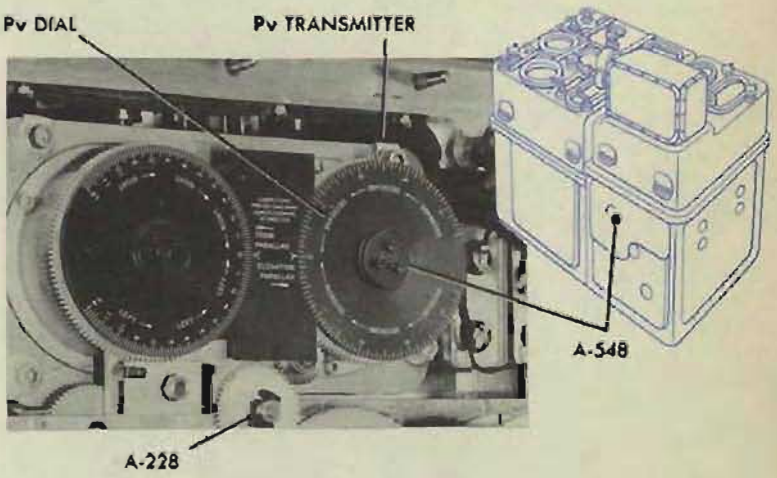
Replace the F3 lead.

Check A-520 and A-195.

A-548 DIAL to SYNCHRO – Pv TRANSMITTER

Location

A-548 is under cover 6, on the dial of the *Pv* transmitter.
A-548 is omitted on Mods 0, 1, 2, 3, 4, 6, 9, and 10.

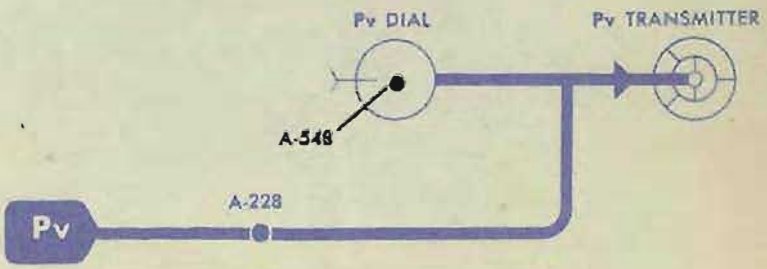


Check

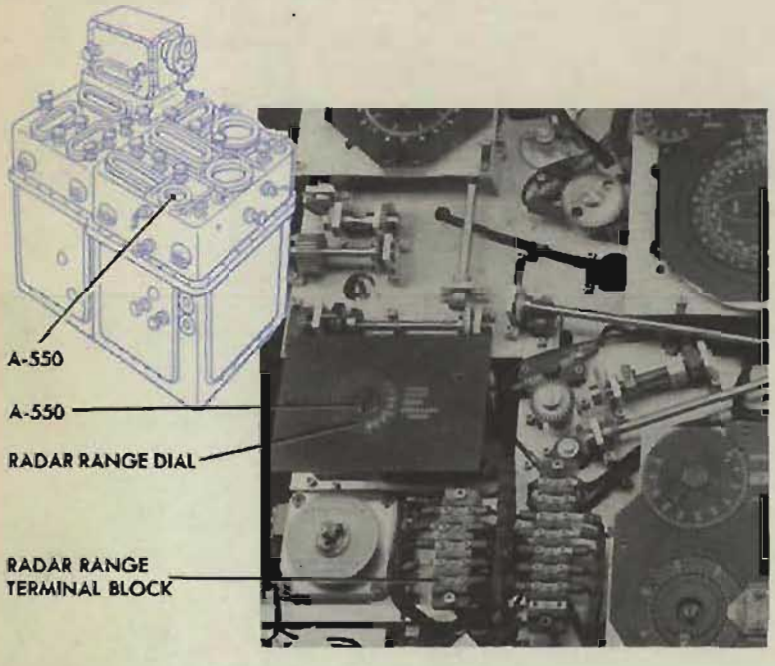
Loosen A-228 to disconnect the *Pv* line.
Set the synchro of the *Pv* transmitter on electrical zero.
The *Pv* dial should read 0°.

Adjustment

If the Pv dial does not read 0°, loosen A-548, and slip the dial to its proper reading.
Tighten A-548, and recheck.
Readjust A-228.



A-550 DIAL to SYNCHRO—RADAR RANGE RECEIVER



Location

A-550 is under cover 1, on the radar range dial.

Check

Connect a standard motor (test synchro) to the radar range receiver terminals. When the standard motor is on electrical zero, the radar range dial should read 10,000 yards.

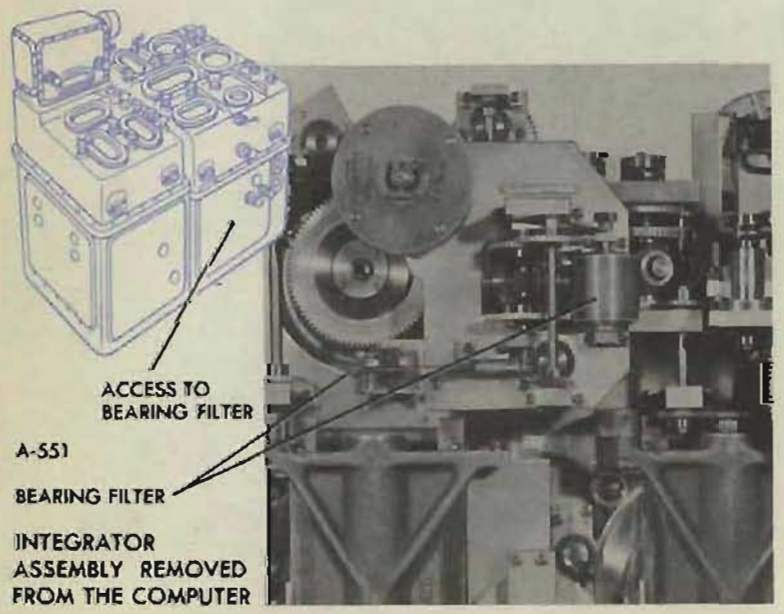
Adjustment

If the radar range dial does not read 10,000 yards when the receiver is on electrical zero, loosen A-550.
Hold the receiver on electrical zero, and slip the dial to its proper value.

Tighten A-550, and recheck.

Disconnect the standard motor from the terminals.

A-551 BEARING FILTER SPRING TENSION



Location

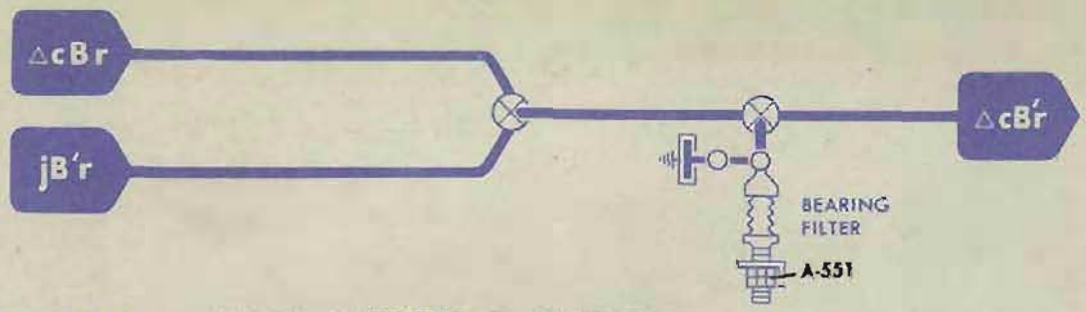
A-551 is under cover 3. It is a nut adjustment on the spring in the bearing filter.
It is omitted on Mod 0.

Check

The spring supports should be 1.57 inches apart.

Adjustment

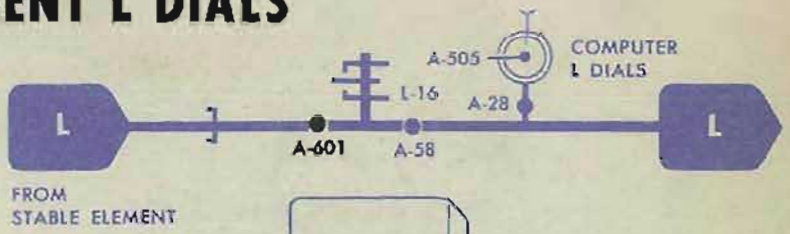
Loosen the locking nut. Turn the adjusting nut until the spring supports are the proper distance apart.
Tighten the locking nut.



A-601 COMPUTER L DIALS to STABLE ELEMENT L DIALS

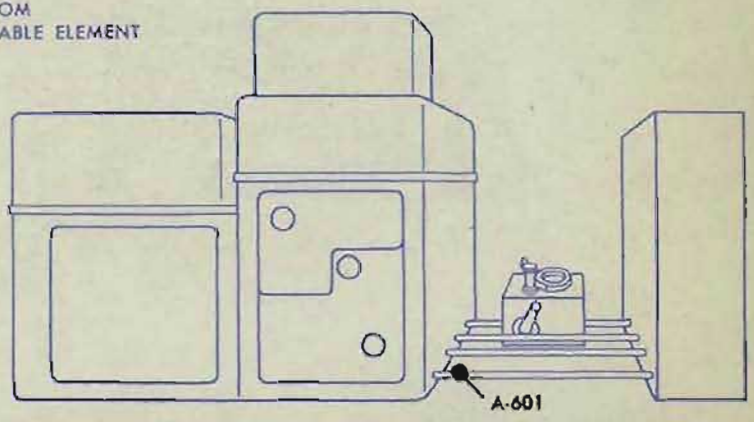
Location

A-601 is a clamp on the *L* shaft between the stable element and the computer.



Check

Set *L* at 2000′ at the stable element. The computer *L* dials should read 2000′.



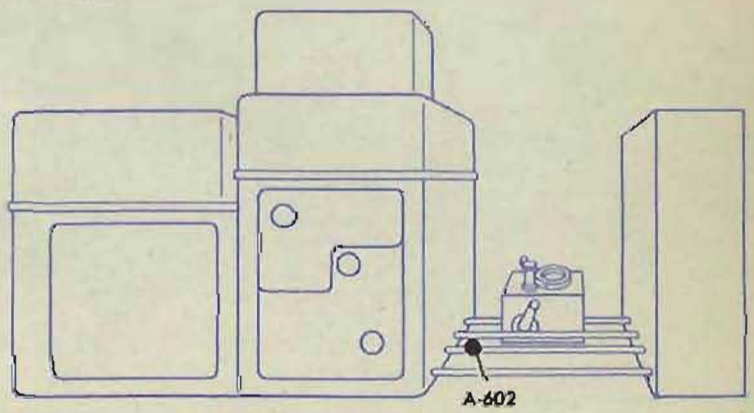
Adjustment

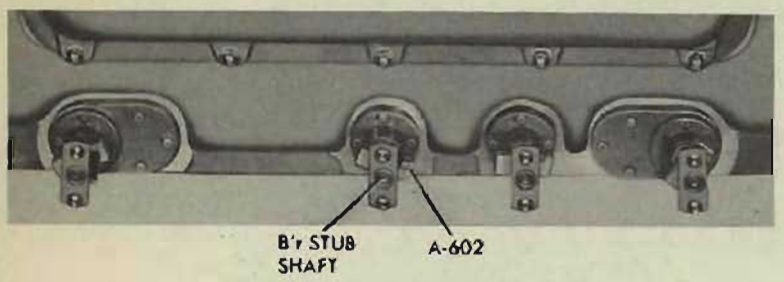
If the computer *L* dials do not read 2000′, loosen A-601 and turn the *L* stub shaft at the base of the computer until the computer and stable element dials agree.
Tighten A-601, and recheck.

A-602 STABLE ELEMENT B′r DIALS to COMPUTER B′r LINE

Location

A-602 is a clamp on the *B′r* shaft between the computer and the stable element.



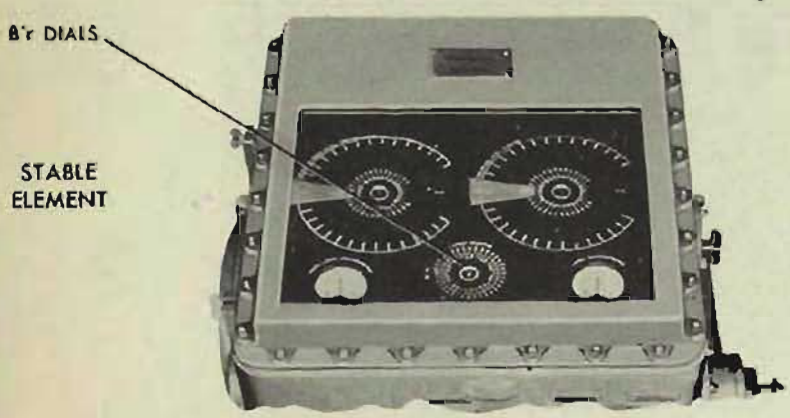


Check

Turn the power OFF.
Set *Dd* at 0°, and wedge the line.

B'r now equals *B'gr*.

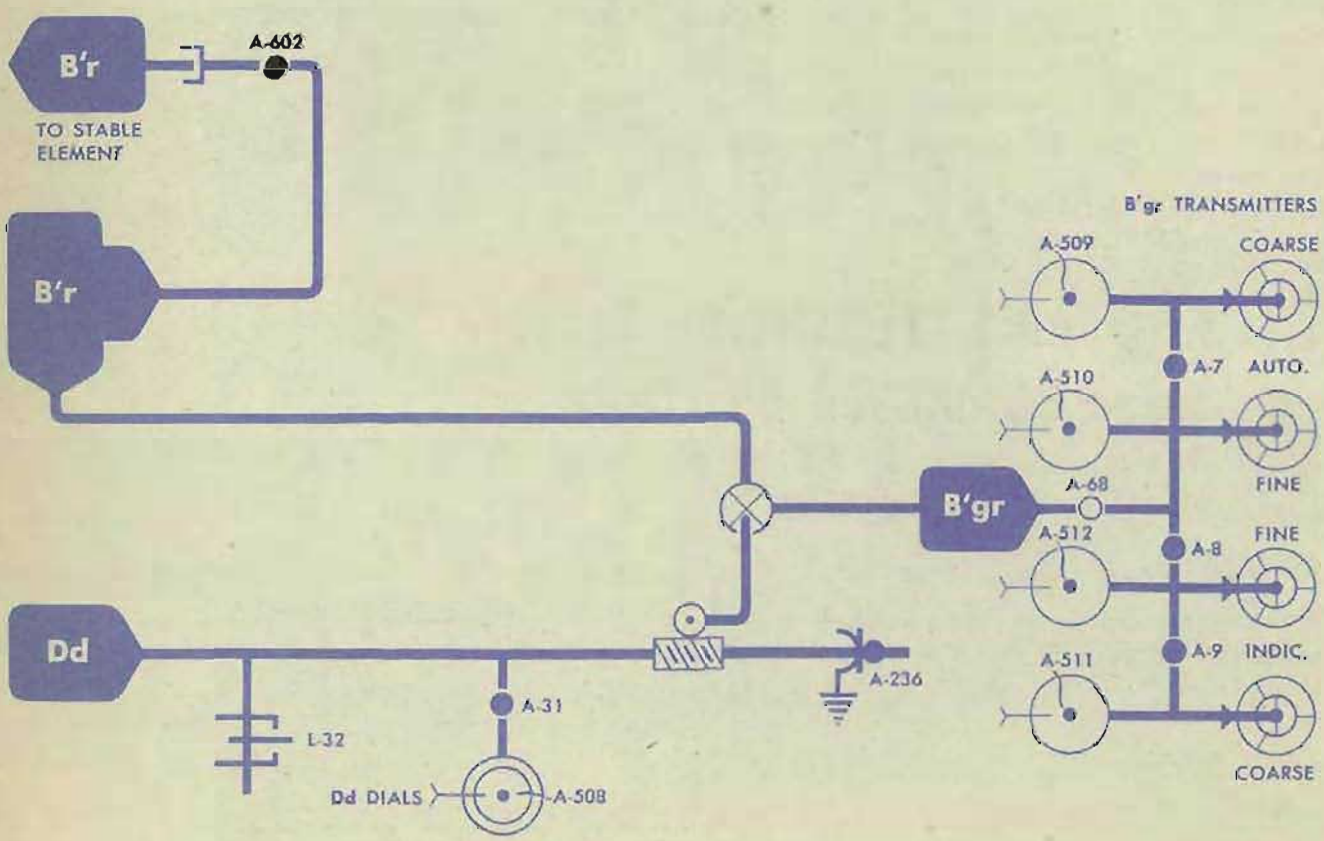
The reading on the stable element *B'r* dials should be the same as the reading on the computer *B'gr* dials.



Adjustment

If the stable element *B'r* dials do not agree with the computer *B'gr* dials, loosen A-602 and turn the *B'r* shaft at the base of the stable element until the dials agree.

Tighten A-602, and recheck.



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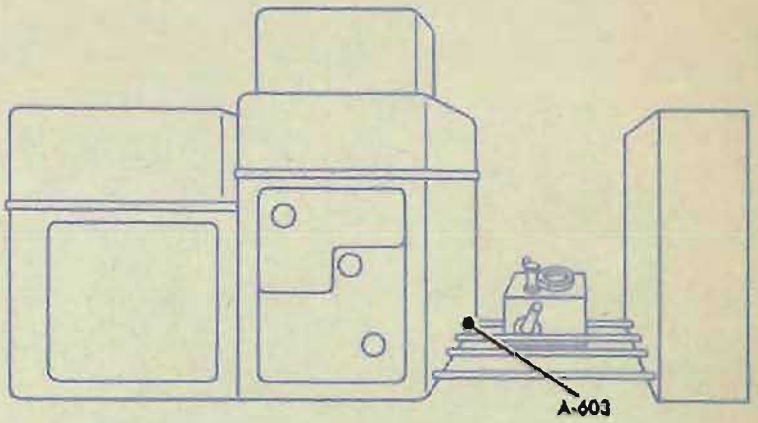
A-603 COMPUTER Zd DIALS to STABLE ELEMENT Zd DIALS

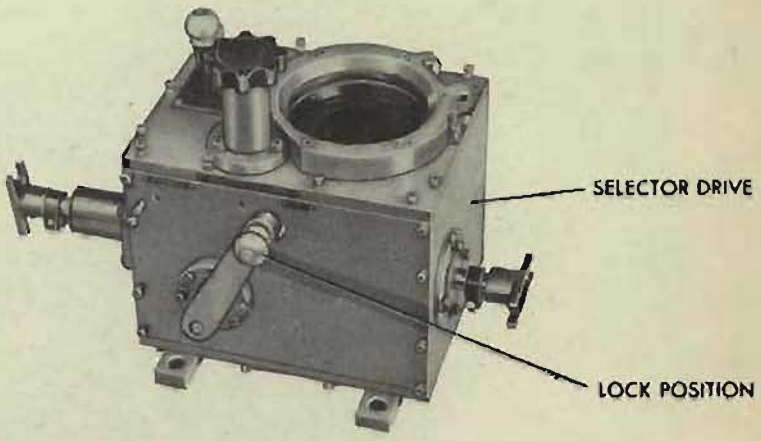
Location

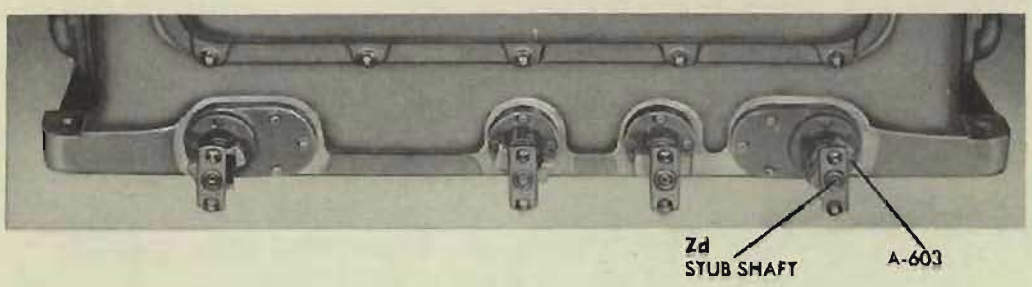
A-603 is a clamp on the *Zd* shaft between the computer and the stable element.



Check

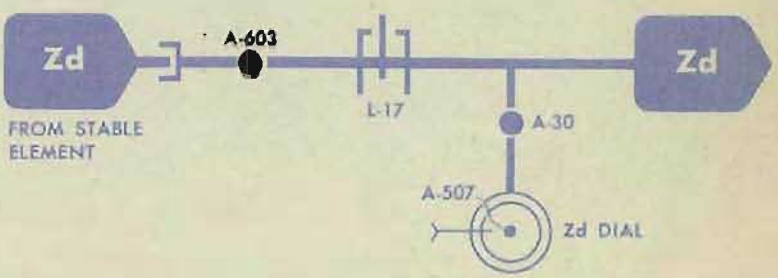
When the selector drive is in the LOCK position, the computer *Zd* dials should agree with the stable element *Zd* dials.





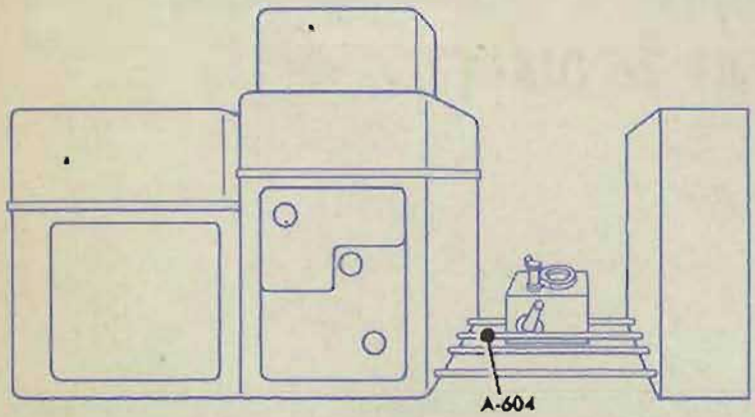
Adjustment

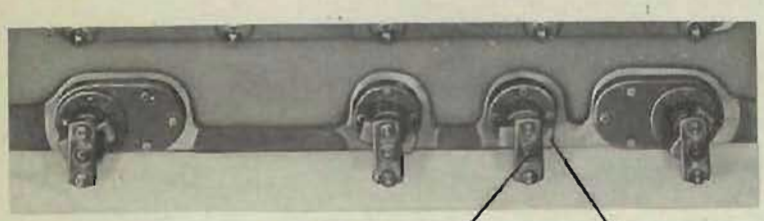
If the computer *Zd* dials do not agree with the stable element *Zd* dials, loosen A-603 and turn the *Zd* stub shaft at the base of the computer until the dials agree.



Tighten A-603, and recheck.

A-604 ASSEMBLY CLAMP





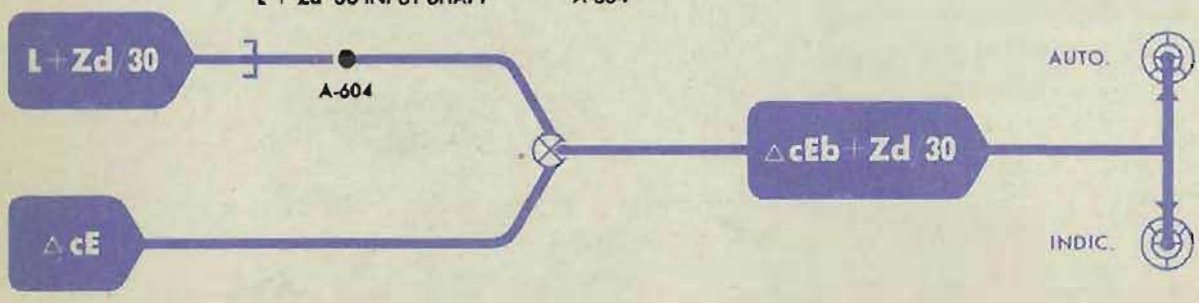
Location

A-604 is on the $L + Zd/30$ shaft, between the computer and the stable element.

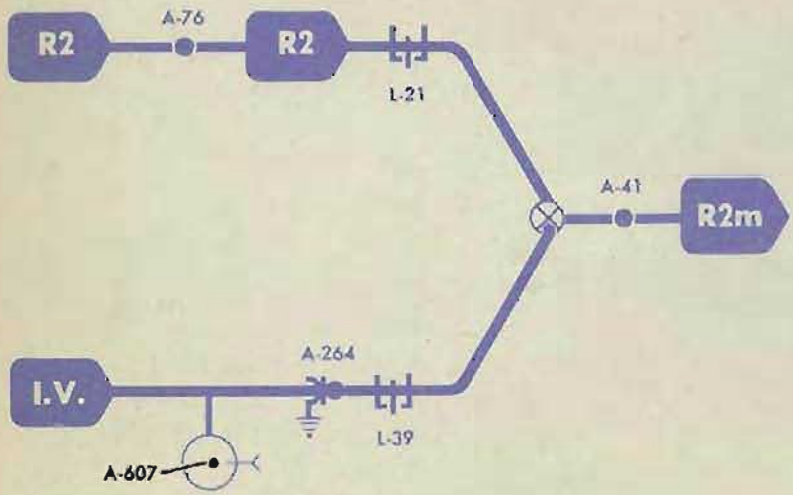
Adjustment

No computer adjustment is necessary since the $L + Zd/30$ input is added only to the ΔcE integrator output.

The clamp must be tight.



A-607 I. V. DIAL to L-39



Location

A-607 is under cover 4, on the *I.V.* dial, on instruments with Ser. Nos. 811 and higher.

Check

The front *I.V.* dial should read 2350 at the lower limit, and 2600 at the upper limit.

Adjustment

If the dial does not read the correct values, hold the line against the stop and loosen A-607. Slip the dial to the correct value.

Tighten A-607 and check at the other limit.

Check A-76.

HANDCRANKS

The handcranks in the computer have various adjustable devices. These are the holding friction, the friction relief drive, and the switch-actuating screw.
Disassembly and repair of a typical handcrank is discussed in OP 1140A.

HOLDING FRICTION

Location

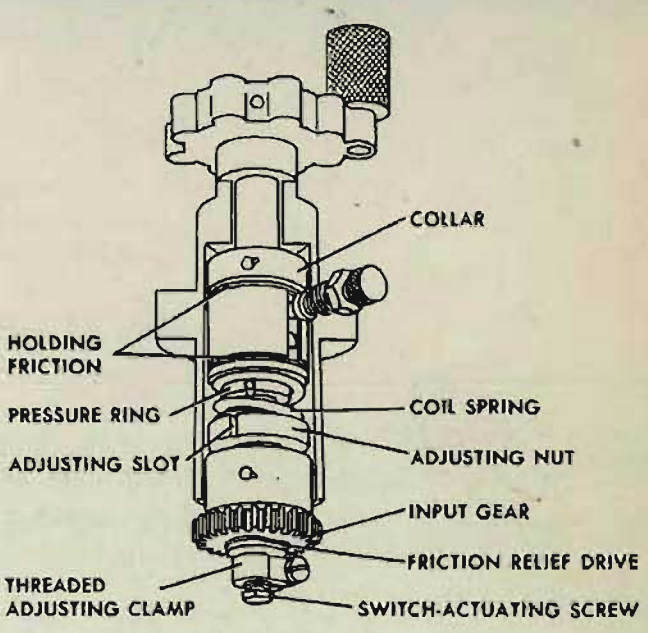
The holding friction is inside the handcrank.

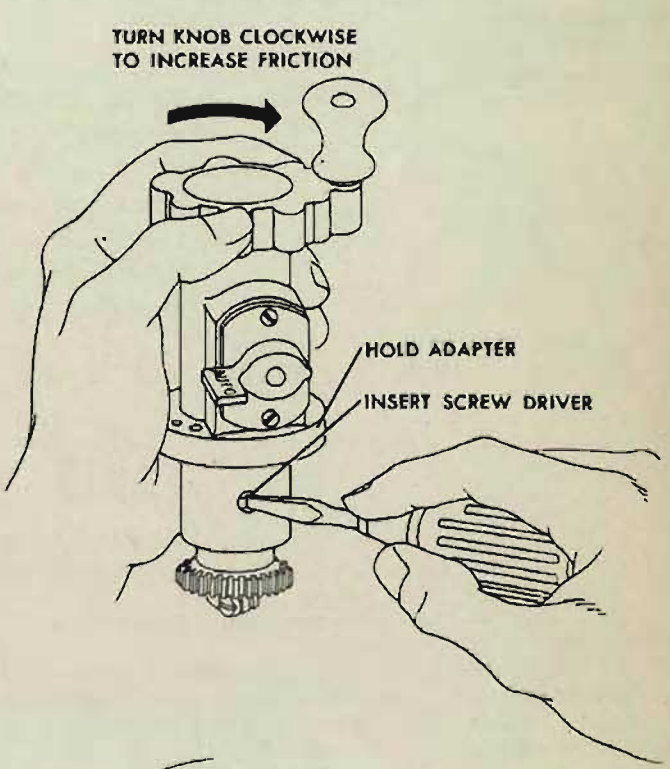
Check

The holding friction should be tight enough to maintain the setting of its quantity under normal operating conditions, yet loose enough for easy operation.

Adjustment

Remove the handcrank from the cover and set it in the outer position. Turn the knob until the adjustment slot appears in the opening; then insert a small screw driver into the slot. Turn the knob clockwise to increase the friction, or counterclockwise to decrease the friction.





FRICTION RELIEF DRIVE

Location

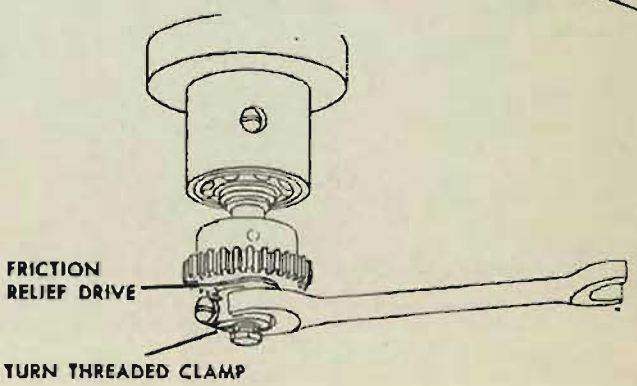
The friction relief drive is at the input gear on the end of the handcrank shaft.

Check

The friction relief drive should be tight enough to drive the line, but loose enough to slip without damaging the shaft line whenever a limit stop is reached.

Adjustment

Loosen the threaded adjustment clamp and turn it clockwise to increase the friction or counterclockwise to decrease the friction. Note that loosening the adjustment clamp also releases the switch-actuating screw. Therefore the screw adjustment should be checked whenever the drive friction is readjusted.



SWITCH-ACTUATING SCREW

Location

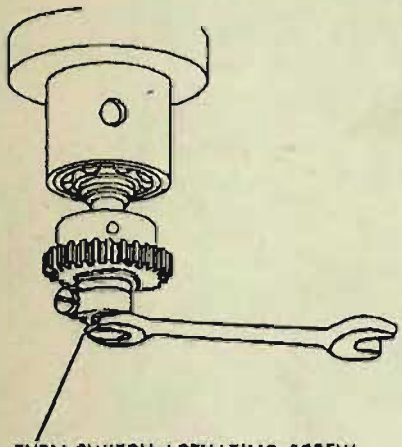
The switch-actuating screw is at the end of the handcrank shaft.

Check

The switch-actuating screw should extend far enough to depress the switch button when the handcrank is at IN or HAND. *It should not extend so far that it damages the switch.*

Adjustment

Loosen the friction relief drive adjustment clamp, but do not turn the clamp because that would change the adjustment of the drive friction. Use a wrench to turn the screw. The screw head must be smooth, because any burr on the surface will dig into the bakelite switch. Make sure that the adjustment clamp is tightened.



TURN SWITCH-ACTUATING SCREW

CAUTION

When reinstalling a handcrank which has a switch-actuating screw, make sure that the screw does not extend too far. To check this on a plunger-type handcrank, pull the plunger out and gently push the handcrank IN. Travel should be limited by the knob striking the adapter. On a lever-type handcrank, gently turn the switch lever to the HAND position. It should reach its limit stop pin with no restriction. In either type of handcrank, *if the travel is limited by the bottom of the switch, the screw extends too far and the switch will be damaged.*

TABLE

The following table indicates which handcranks have frictions, and which ones operate switches.

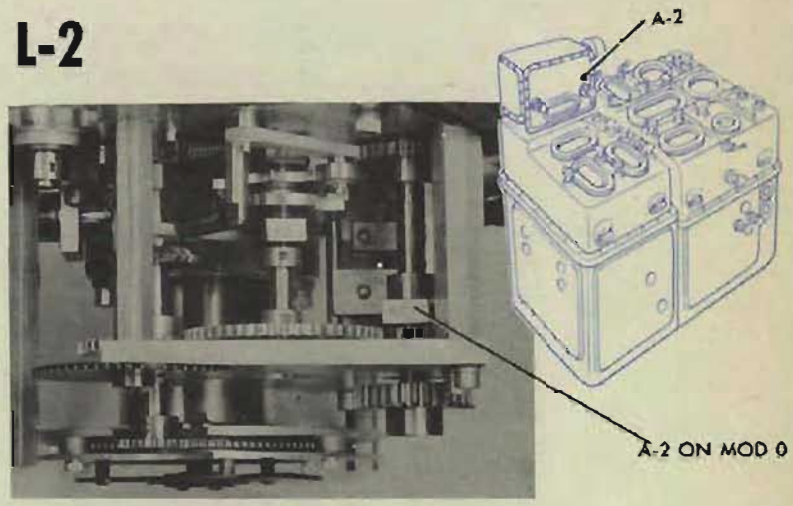
HANDCRANK	FRICTION DRIVE	HOLDING FRICTION	OPERATES SWITCH
Deflection Spot (Dj)	X	X	X
Elevation Spot (Vj)	X	X	X
Range Spot (Rj)	X	X	X
Fuze (F)	X	X	X
Sight Angle (Vs)	X	X	X
Sight Deflection (Ds)	X	X	X
Synchronize Elevation	X	Note A	Note B
Wind Speed (Sw)	X		
Ship Speed (So)	X	X	X
Target Speed (Sh)	X	X	X
Rate of Climb (dH)		X	
Target Angle (A)		X	X
Ship Course (Co)		X	X
Wind Direction (Bw)			
Range Rate (dR)	X	X	X
Time (T)	X		
Generated Bearing (jBr)			
Generated Elevation (jE)	X		
Generated Range (jR)	X		
Dead Time (Tg)	X		
Initial Velocity (I.V.)	X		
Range Rate Ratio (Rr)		X	

Note A: Holding friction to be such that handcrank in IN position rotates when either limit of L-12 is reached.
Note B: Switch to be open in OUT position, and closed in CENTER and IN positions.

STAR SHELL READJUSTMENT

A-1 ASSEMBLY CLAMP (see A-18)

A-2 Rjn RING DIAL to L-2



Location

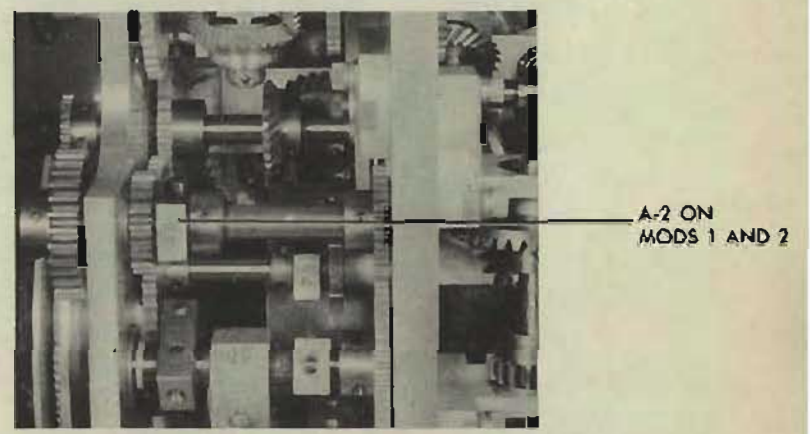
A-2 is under the front cover, behind the *Rjn* input.

Check

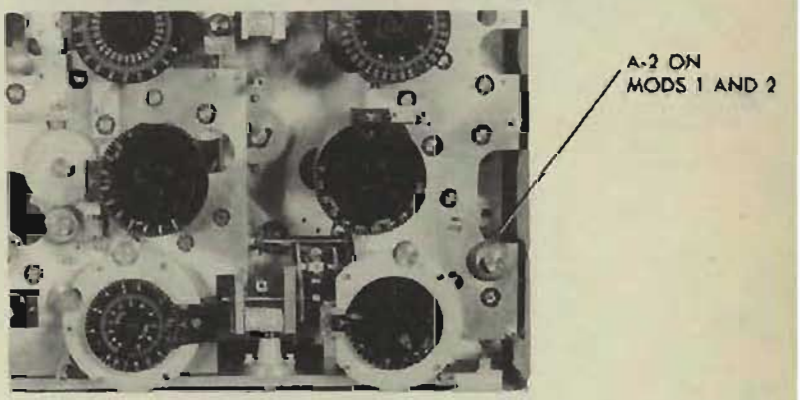
L-2 should function at:

IN 1500 yards and OUT 1500 yards, on Mod 0.
IN 2857 yards and OUT 1500 yards, on Mod 1.
IN 2700 yards and OUT 1500 yards, on Mod 2.

NOTE: On Mods 1 and 2, the IN limit is indicated by a red dot beyond the IN 1500-yard graduation.



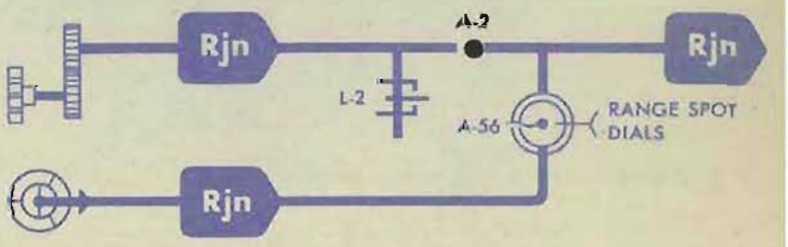
Turn the *Rjn* input in an increasing direction until the limit of the stop is reached. The *Rjn* ring dial should read 1500 yards OUT.



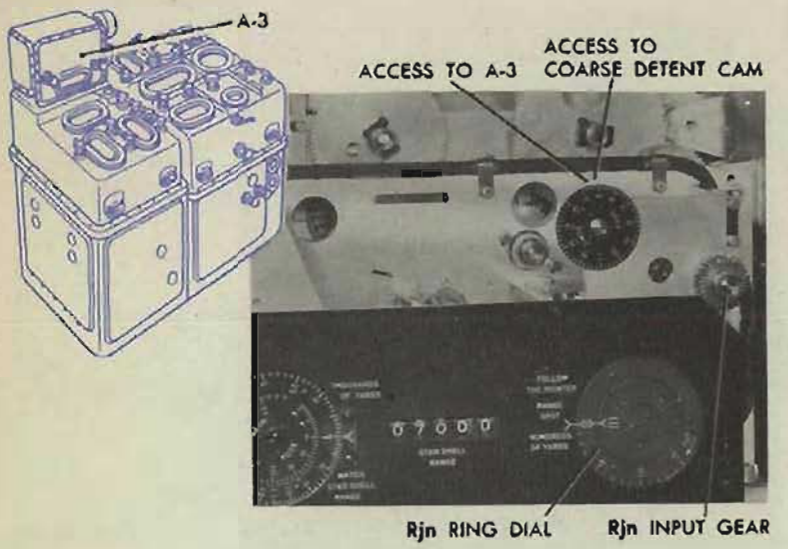
Adjustment

Loosen A-2.
Hold the *Rjn* input gear against the upper limit of the stop. Turn the spur gear in front of A-2 until the ring dial reading is correct.

Tighten A-2 and recheck at the IN limit.

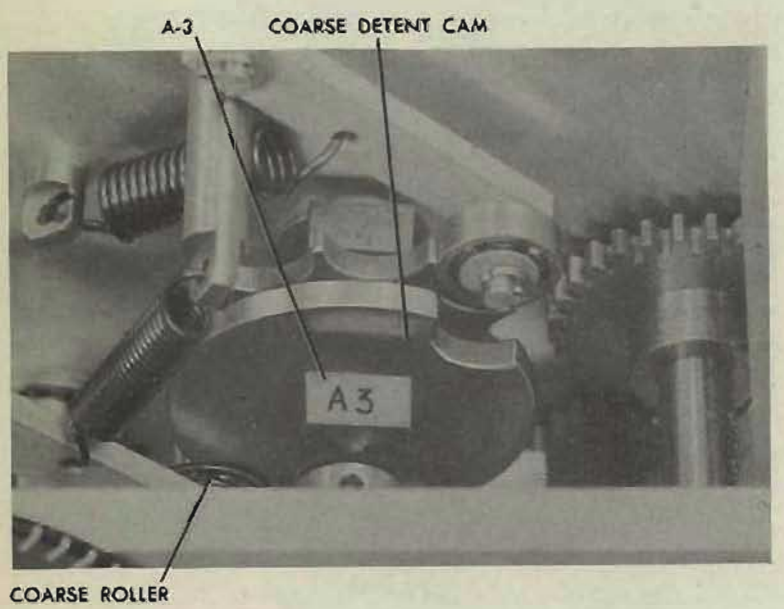


A-3 COARSE DETENT to Rjn RING DIAL



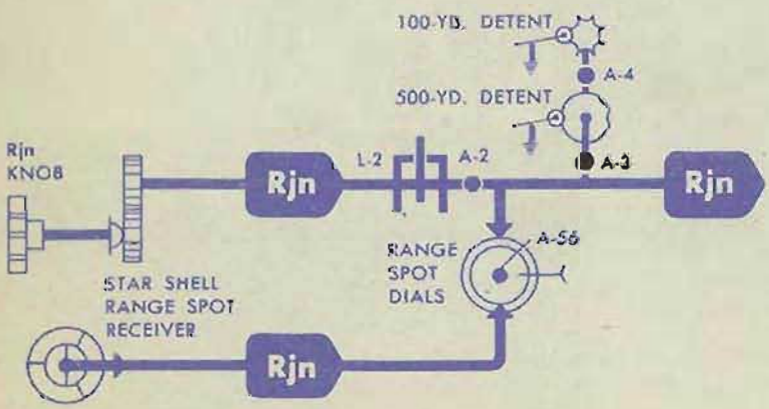
Location

A-3 is under the front cover, on the coarse detent cam, behind the *Rjn* input. A-3 is omitted on Mods 1 and 2.



Check

Set the *Rjn* ring dial at 0. Use the *Rjn* input gear.
The coarse detent roller should be in a notch of the coarse cam.



Adjustment

If the coarse detent roller is not in a notch on the coarse cam, loosen A-3. Turn the cam until the detent roller enters either notch.

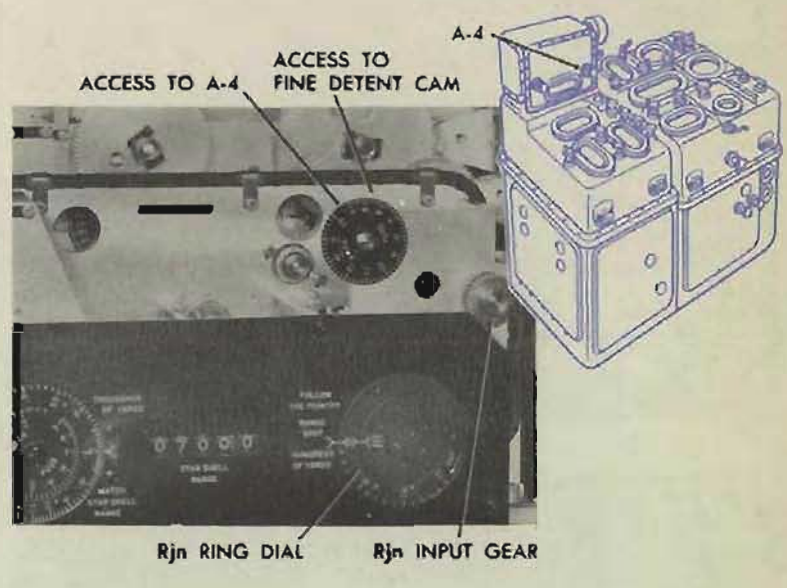
Tighten A-3 and recheck.

The detent should act at every 500-yard setting of the *Rjn* ring dial.

A-4 FINE DETENT to Rjn RING DIAL

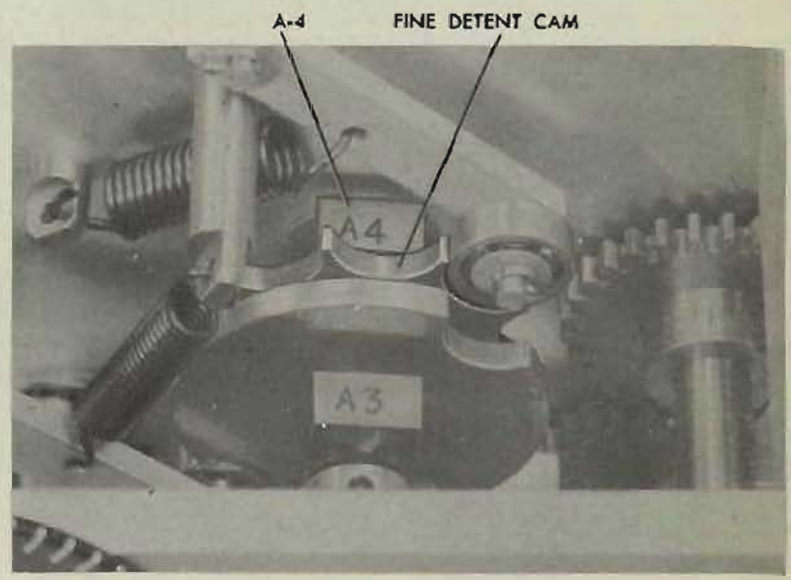
Location

A-4 is under the front cover, on the fine detent cam, behind the *Rjn* input.



Check

Set the *Rjn* ring dial at 0. Use the *Rjn* input gear.
The fine detent roller should be in a notch of the fine cam.

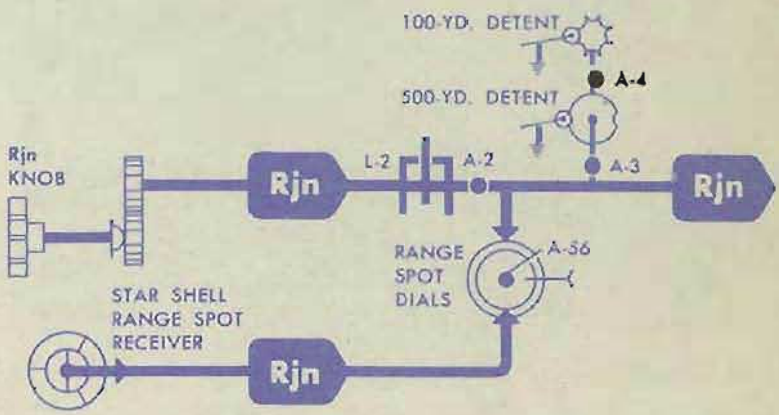


Adjustment

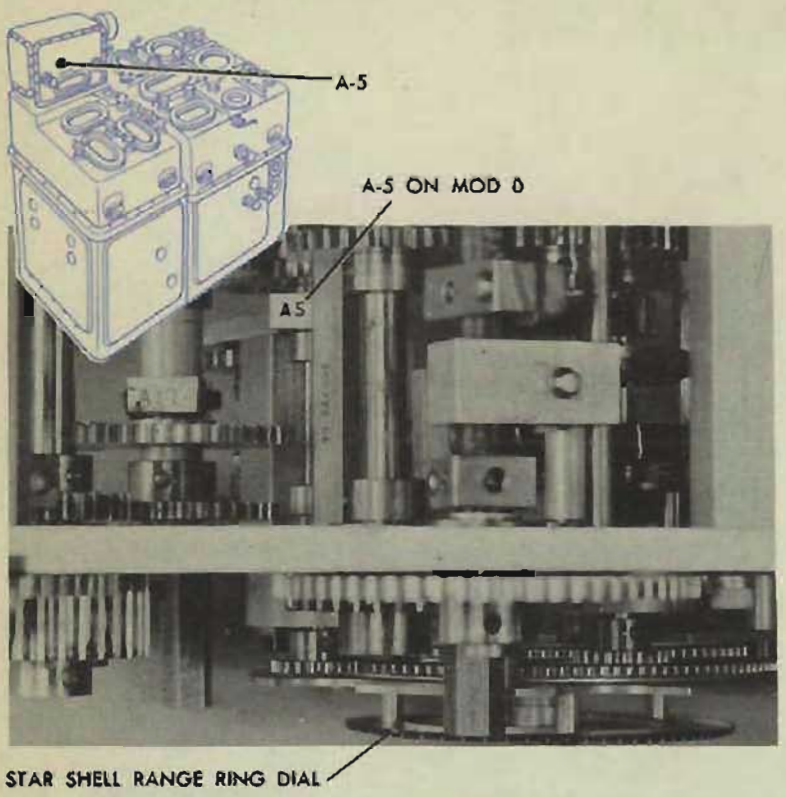
If the fine detent roller is not in a notch of the fine cam, loosen A-4. Turn the cam until the detent roller enters a notch.

Tighten A-4 and recheck.

The detent should act at every 100-yard setting of the *Rjn* ring dial.



A-5 STAR SHELL RANGE RING DIAL to L-4



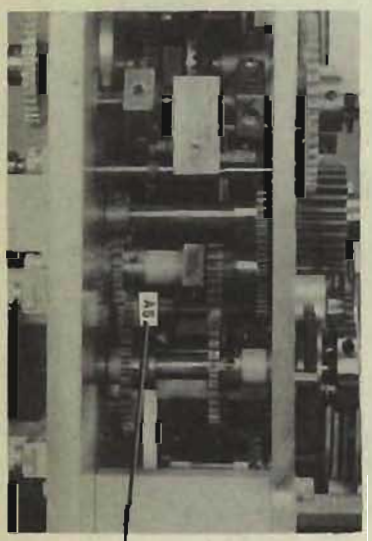
Location

A-5 is under the front cover. On Mods 1 and 2, A-5 can be reached through an access hole under the junction box cover.

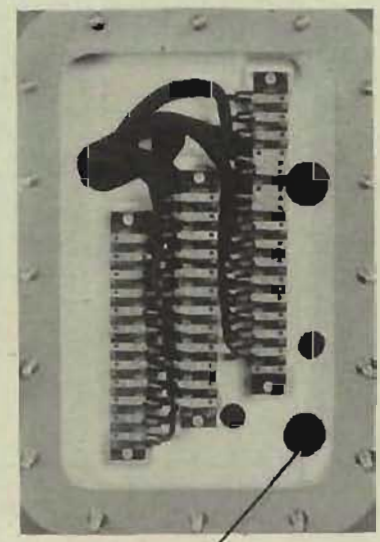
Check

On Mods 0 and 1, L-4 should operate at 4,000 and 15,000 yards on the *jDwn* ring dial. On Mod 2 it should operate at 8,000 and 19,500 yards.

Decrease star shell range to the lower limit of the stop. The *jDwn* ring dial should read 4,000 yards (8,000 yards on Mod 2).



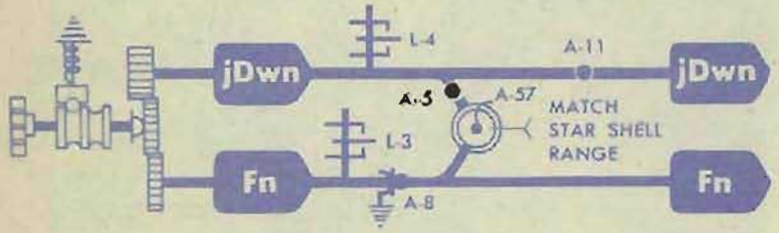
A-5 ON MODS 1 AND 2


ACCESS TO A-5 ON MODS 1 AND 2

Adjustment

If the *jDwn* ring dial does not read 4,000 yards (8,000 on Mod 2), loosen A-5. Hold the *jDwn* line against the stop and turn the small spur gear at the left of the ring dial until the dial reading is correct.

Tighten A-5, and check at the upper limit. Check A-11 in the star shell computer and A-231 in the Computer Mark 1.



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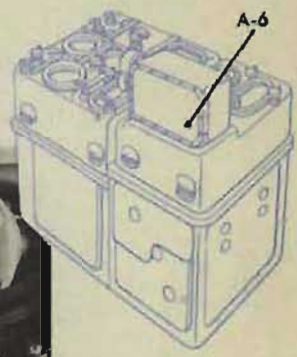
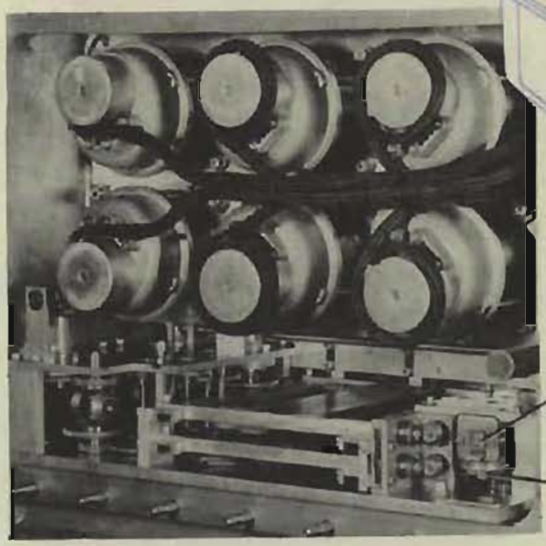
A-6 STAR SHELL DEFLECTION COUNTER to L-1



Location

A-6 is under the rear cover, below the star shell deflection counter.

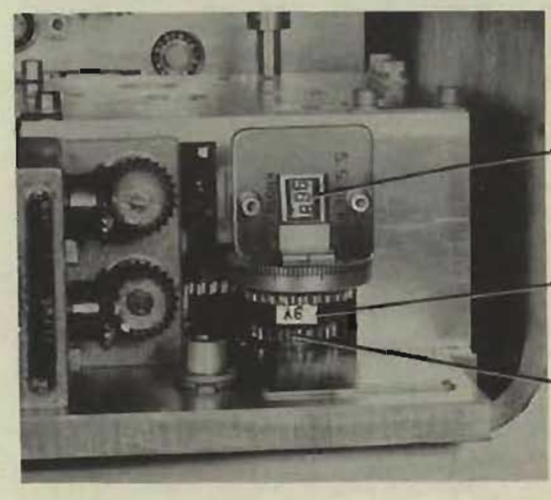


Check

L-1 should operate at +60 knots (counter reading 060) and −60 knots (counter reading 940).

Turn the power OFF.

Run the *WrD + KRdBs* line to the upper end of the limit stop by turning the spur gear under clamp A-6. The star shell deflection counter should read 060.



Adjustment

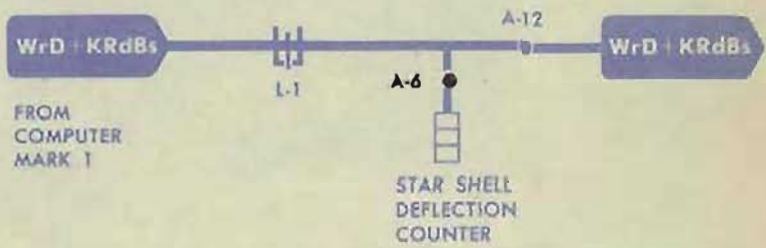
If the counter does not read 060, slip-tighten A-6. Turn the counter gearing until the counter reading is correct.

Tighten A-6, and recheck at the lower limit. Split any overtravel.

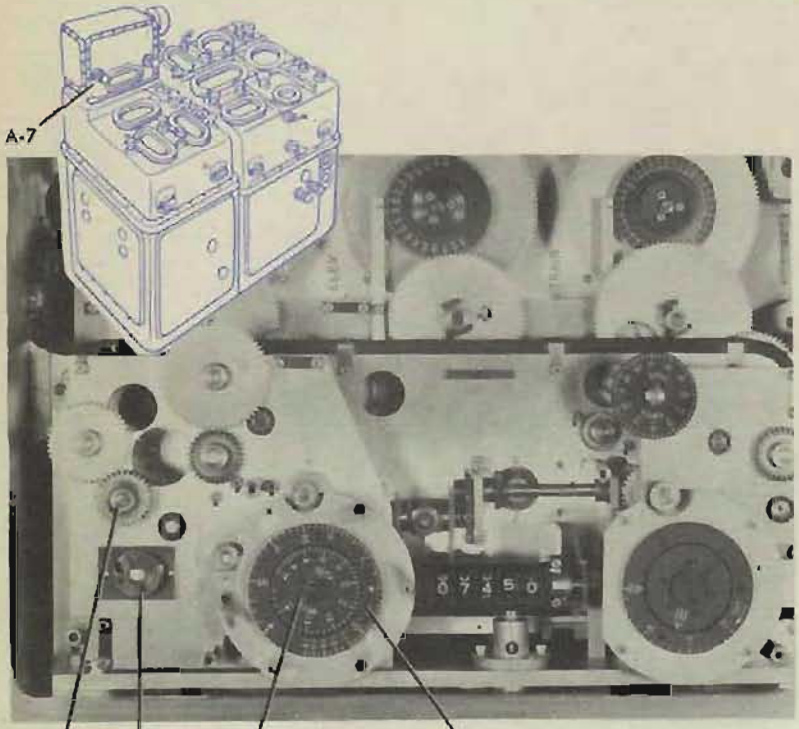
Note

If a long graduation on the drum does not line up with the index when the counter digits are centered, loosen the small clamp on the counter shaft, and align the drum with the counter. Recheck A-6.

Check A-12 in the star shell computer and A-230 in the Computer Mark 1.



A-7 jDwn HOLDING FRICTION



Location

A-7 is under the front cover, below the *jDwn* input gear.

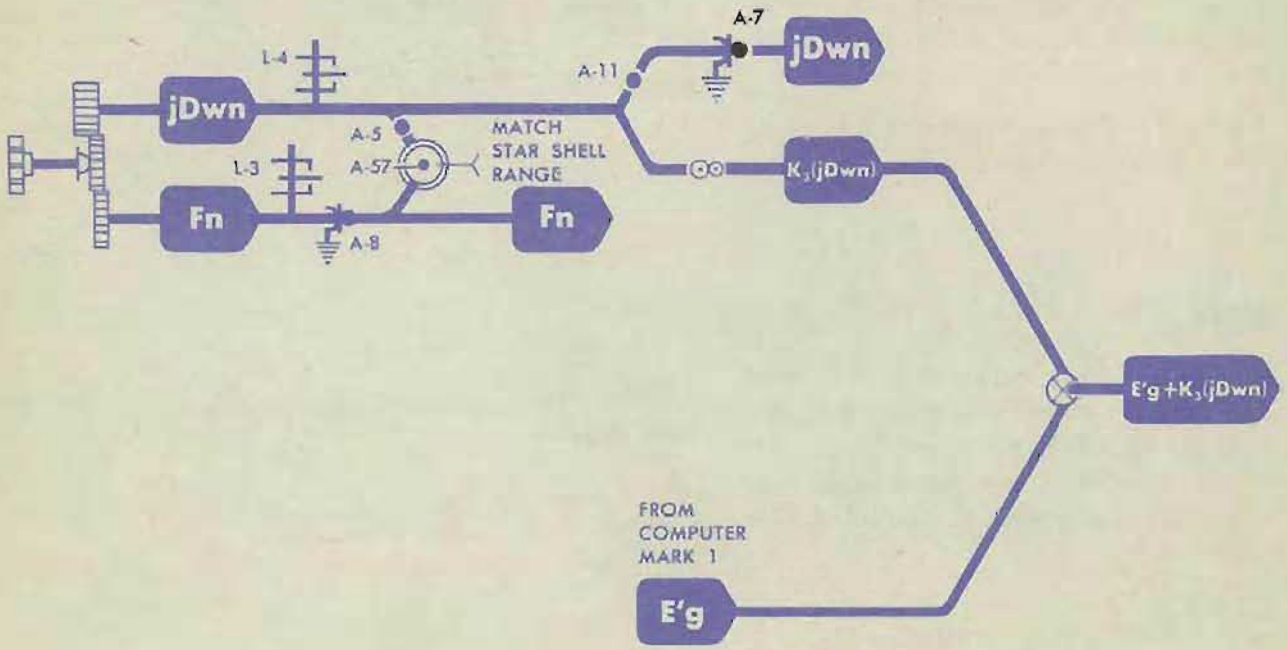
Check

A-7 should hold the *jDwn* setting without too much drag on the line. Increase and decrease *E'g* rapidly. There should be no movement of the *jDwn* range dial.

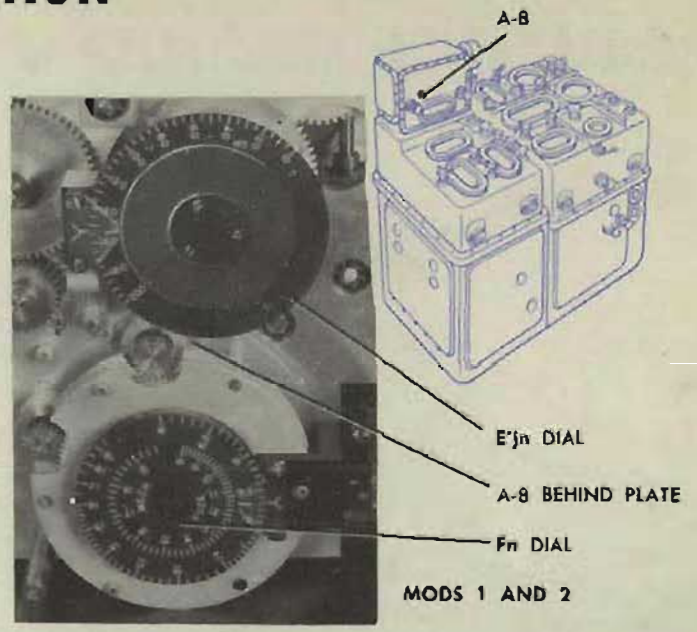
Adjustment

If *E'g* backs out the *jDwn* line and moves the dial, loosen A-7. Turn the clamp clockwise to increase the friction.

Tighten A-7, and recheck.



A-8 Fn HOLDING FRICTION



Location

A-8 is under the front cover.

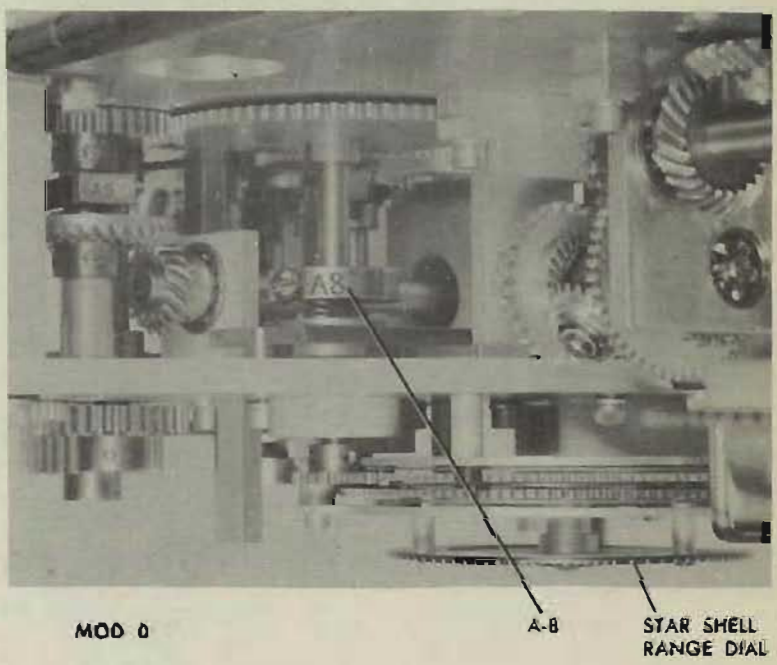
Check

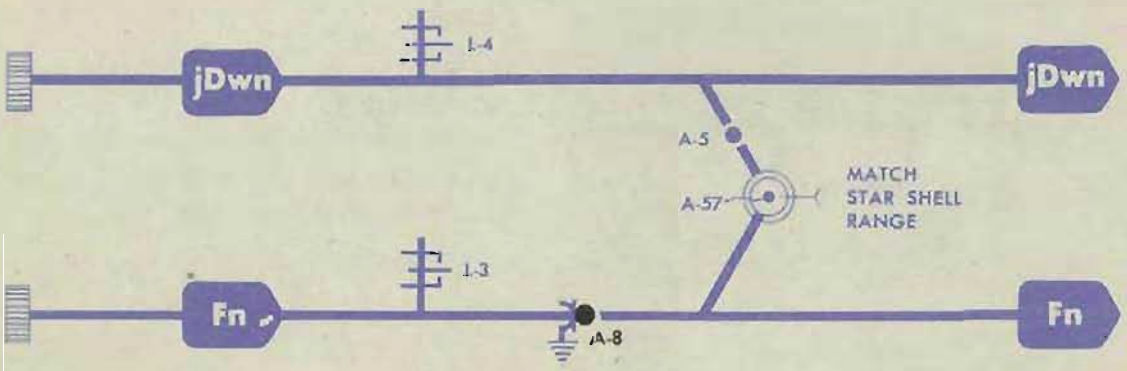
A-8 should hold the *Fn* setting without too much drag on the line.

Adjustment

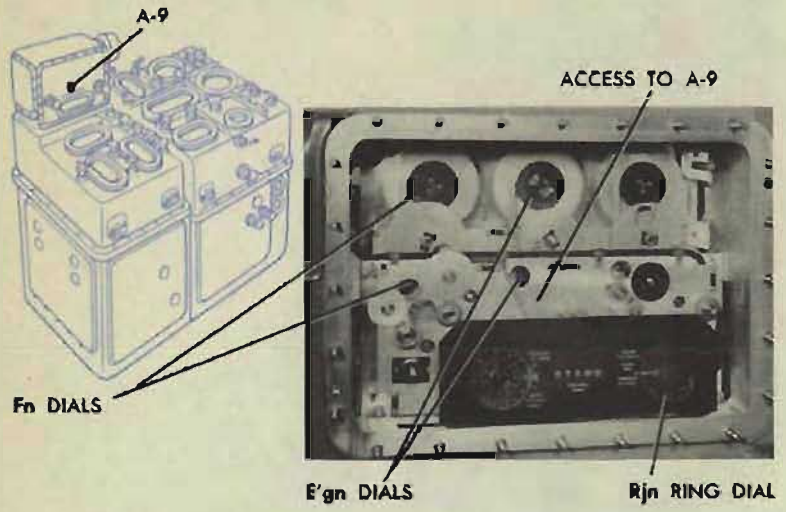
If the *Fn* setting moves off as the transmitters are energized, loosen A-8. Turn the clamp clockwise to increase the friction.

Tighten A-8, and recheck.





A-9 ELEVATION MULTIPLIER to Fn DIALS

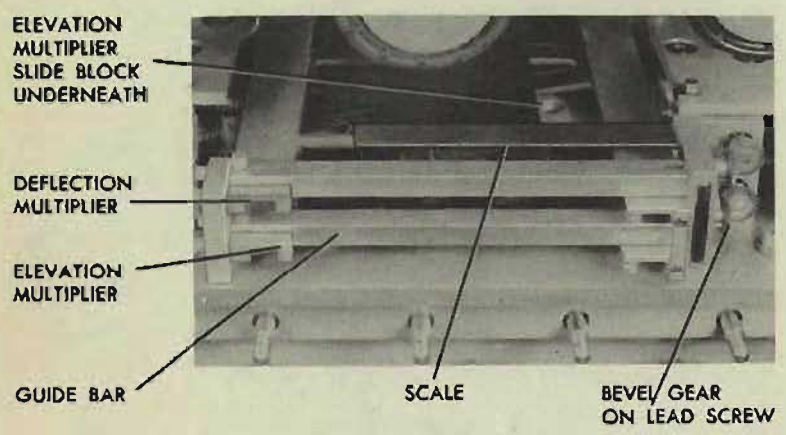


Location

A-9 is under the front cover. On Mods 1 and 2, A-9 is reached through an access hole at the side.

Check

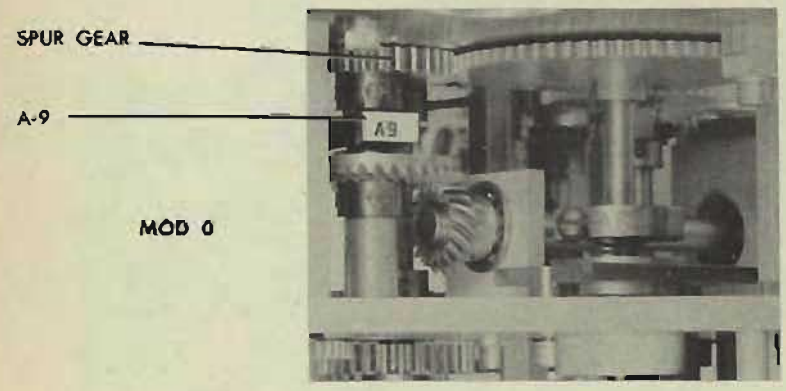
Set *Fn* at 20.85 seconds.
The edge of the elevation multiplier slide block should be exactly 2½ inches from the end of the multiplier.



Adjustment

If the block is not 2½ inches from the end of the multiplier, slip-tighten A-9.
Wedge *Fn* at 20.85 seconds.
Turn the small bevel gear on the lead screw of the multiplier until the slide block is positioned correctly.
Tighten A-9, and recheck.
Remove the wedge.

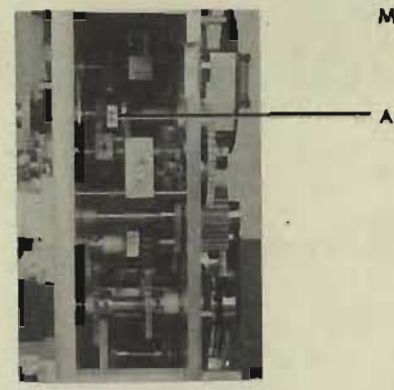
A-9 ALTERNATE METHOD of readjusting



Check

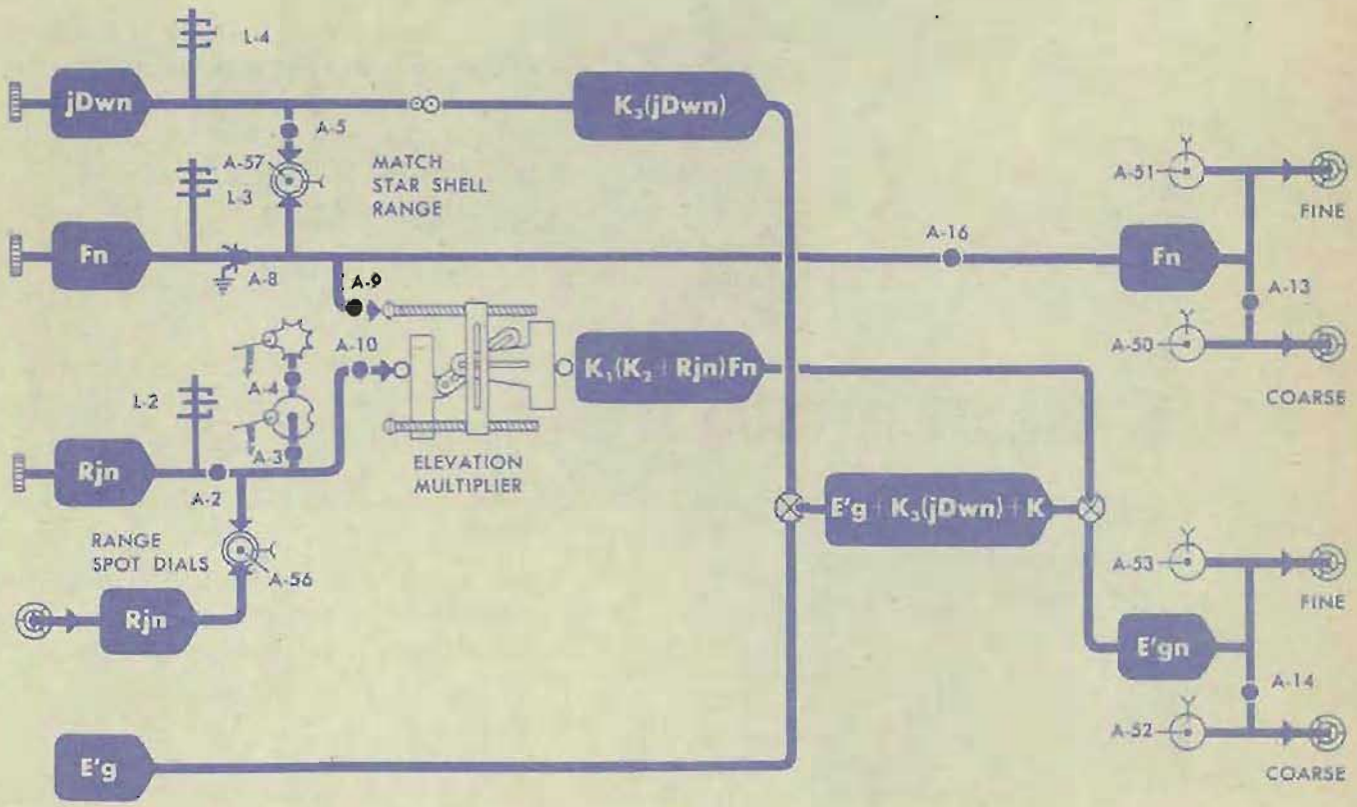
Wedge the *E'g* line from the Computer Mark 1.
Wedge the *jDwn* input line.
On Mods 1 and 2, wedge the *E'jn* line.
Set *Fn* at 35.00 seconds.

Set the *Rjn* ring dial at IN 1400 yards. Read the *E'gn* dials (*E'gjn* dials on Mods 1 and 2).
The input screw of the elevation multiplier should be positioned so that increasing *Rjn* to OUT 1400 yards causes *E'gn* (or *E'gjn*) to increase 393.4′ on Mods 0 and 1, or 315.5′ on Mod 2.



Adjustment

If *E'gn* (or *E'gjn*) does not increase the correct amount, slip-tighten A-9.
Turn the spur gear at the rear of A-9 until the change in *E'gn* (or *E'gjn*) is correct.
Tighten A-9, and recheck.
Remove the wedges from the *E'g*, *E'jn*, and *jDwn* lines.
Check A-231 in Computer Mark 1.



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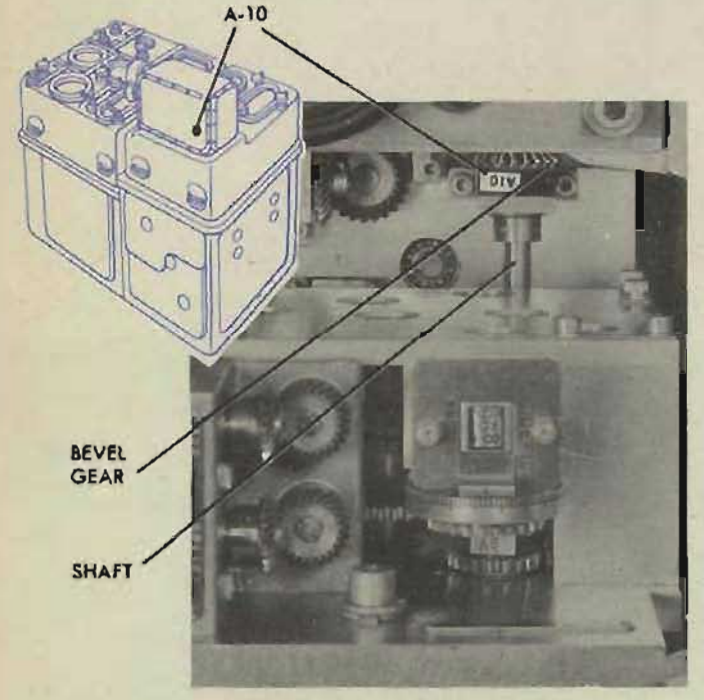
A-10 ELEVATION MULTIPLIER to Rjn RING DIAL

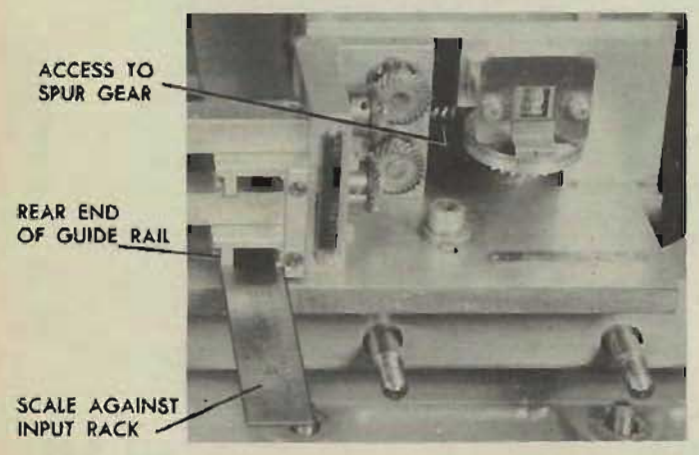


Location

A-10 is under the back cover, above and in front of the star shell deflection counter.

Check

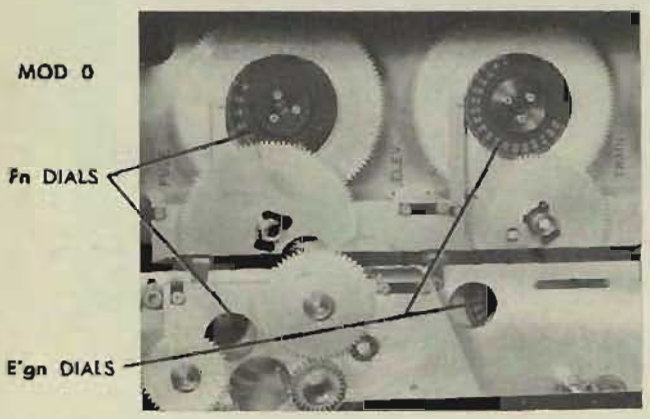
Set the *Rjn* dial at IN 200 yards. The multiplier input rack should be exactly 2½ inches from the rear end of the guide rail.



Adjustment

If the rack is not exactly 2½ inches from the end of the guide rail, slip-tighten A-10.
Wedge the *Rjn* line at IN 200 yards.
Turn the spur gear which meshes with the input rack until the rack is 2½ inches from the end of the guide rail.
Tighten A-10, and recheck.
Remove the wedge.

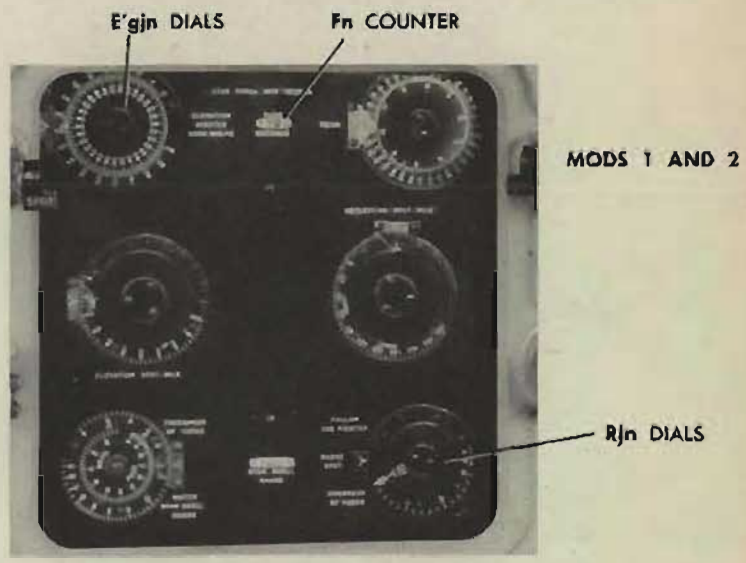
A-10 ALTERNATE METHOD of readjusting



Check

Wedge the *E'g* line from the Computer Mark 1.
On Mods 1 and 2, wedge the *E'jn* line.
Wedge the *jDwn* input line.
Set the *Rjn* ring dial at OUT 1,000 yards. Use the *Rjn* input gear.
Set *Fn* at 10.00 seconds. Use the *Fn* input gear.

Read the *E'gn* dials (*E'gjn* dials on Mods 1 and 2). Increase *Fn* to 30.00 seconds.
The *E'gn* (or *E'gjn*) dial reading should have increased 309.6′ on Mods 0 and 1, or 203.3′ on Mod 2.

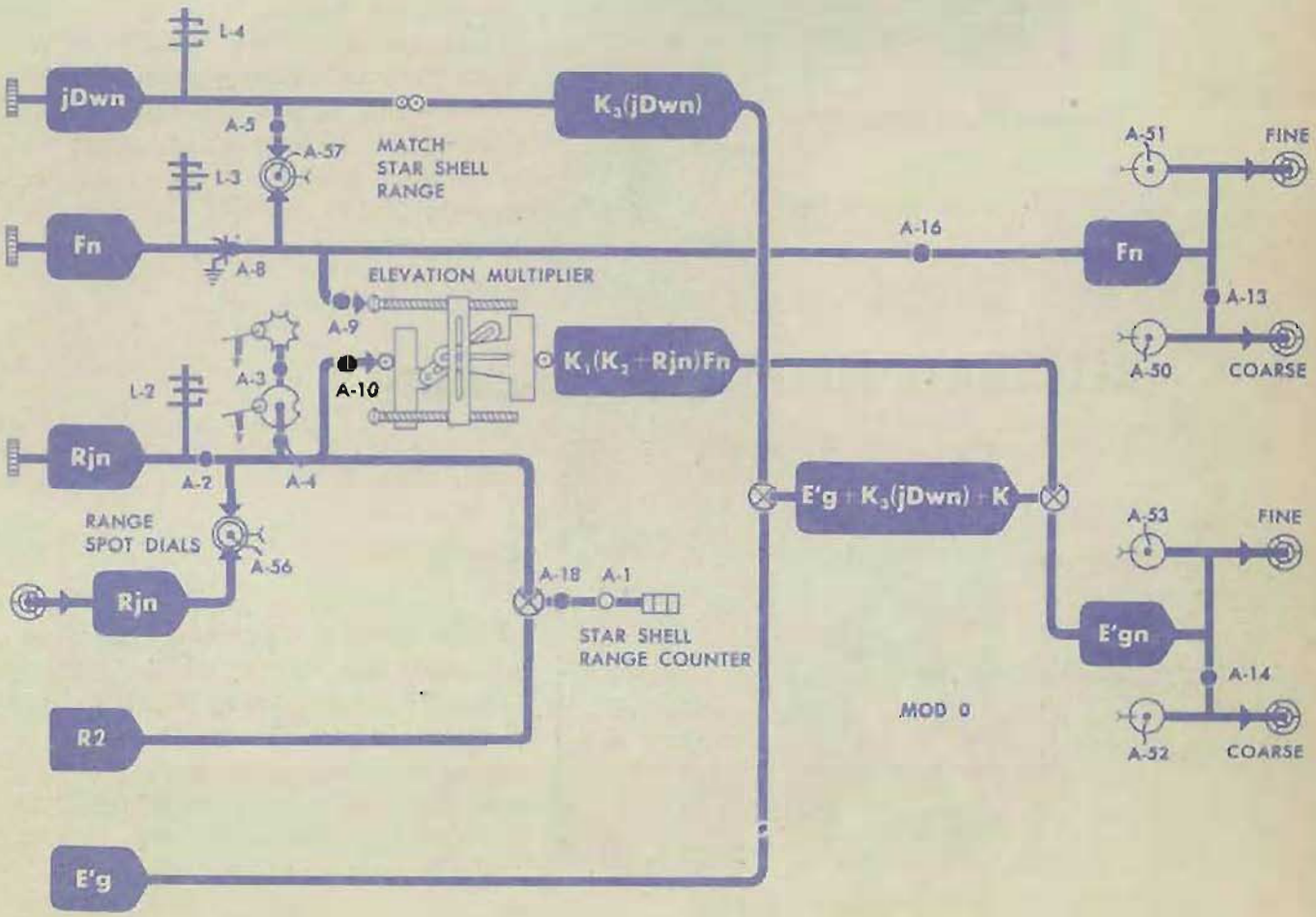


Adjustment

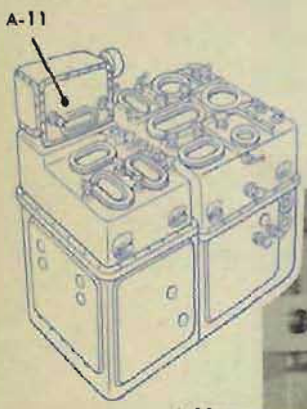
If *E'gn* (or *E'gjn*) does not increase the proper amount, slip-tighten A-10. Hold the bevel gear and turn the shaft below A-10 until the change in *E'gn* (or *E'gjn*) is correct.

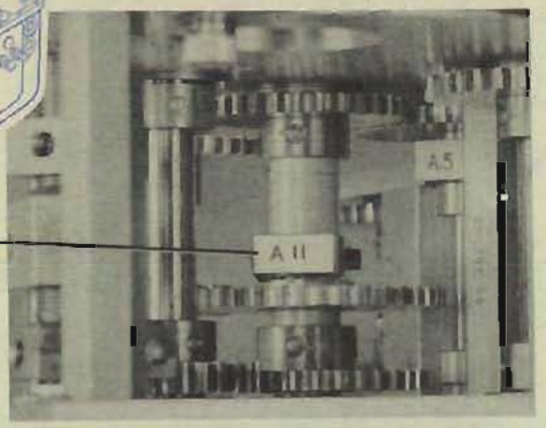
Tighten A-10, and recheck.

Remove the wedges on the *E'g*, *E'jn*, and *jDwn* lines.
Check A-231 in Computer Mark 1.



A-11 DEFLECTION MULTIPLIER to jDwn LINE



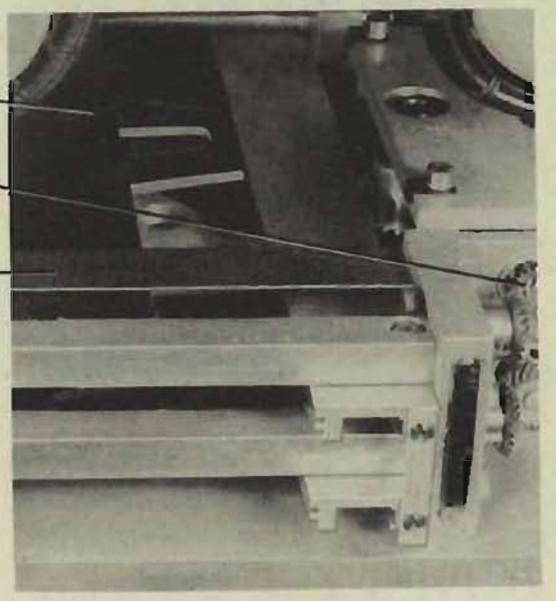


Location

A-11 is under the front cover, on the *jDwn* line. On Mods 1 and 2, A-11 can be reached through an access hole under the junction box cover.

Check

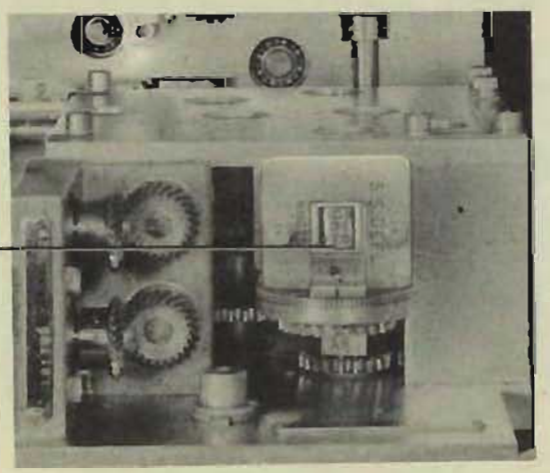
Set the *jDwn* ring dial at 8,000 yards. On Mods 0 and 1, the slide block on the deflection multiplier should be exactly 2½ inches from the end of the multiplier. On Mod 2, it should be ½ inch from the end of the multiplier.



Adjustment

If the block is not correctly positioned in relation to the end of the guide rail, slip-tighten A-11.
Wedge the *jDwn* line at 8,000 yards.
Turn the small bevel gear on the leadscrew input of the deflection multiplier until the block is the correct distance from the end of the multiplier.
Tighten A-11, and recheck.
Remove the wedge.
Check A-17.

A-11 ALTERNATE METHOD of readjusting



Check

Wedge the *B'gr* input line from Computer Mark 1.
On Mods 1 and 2, wedge the *B'jn* line.
Set star shell deflection at 0 knots.
On Mods 0 and 1, set the *jDwn* ring dial at 5,000 yards; on Mod 2, at 8,000 yards. Read the *B'grn* dials (*B'grjn* dials on Mods 1 and 2).

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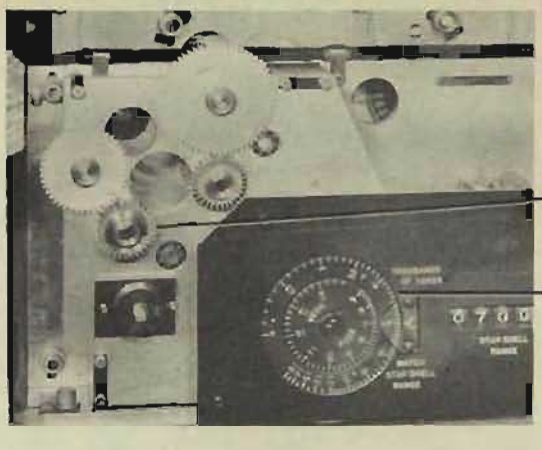
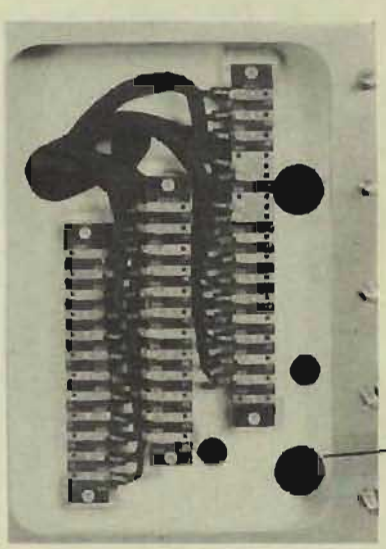
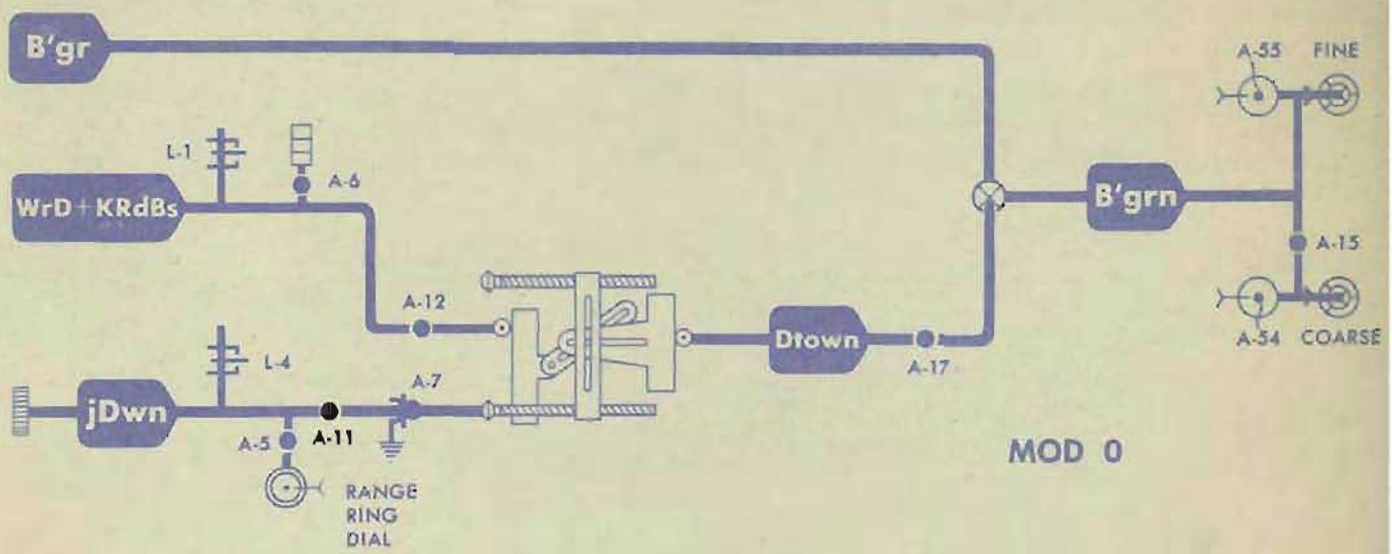
Increase star shell deflection to 50.0 knots.
The reading on the *B'grn* (or *B'grjn*) dials should have increased 9°41′ on Mods 0 and 1, or 6°03′ on Mod 2.



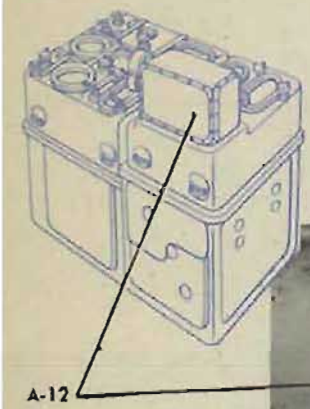
Adjustment

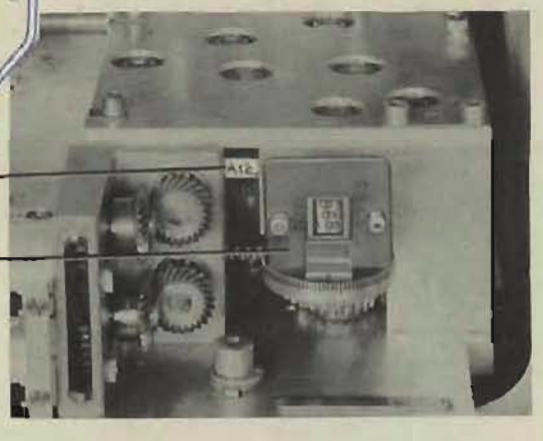
If the *B'grn* (or *B'grjn*) dials do not show the correct increase, slip-tighten A-11.
Turn the spur gear at the rear of A-11 until the change in *B'grn* (or *B'grjn*) is correct.
Tighten A-11, and recheck.
Remove the wedges.
Check A-17.





A-12 DEFLECTION MULTIPLIER to STAR SHELL DEFLECTION COUNTER





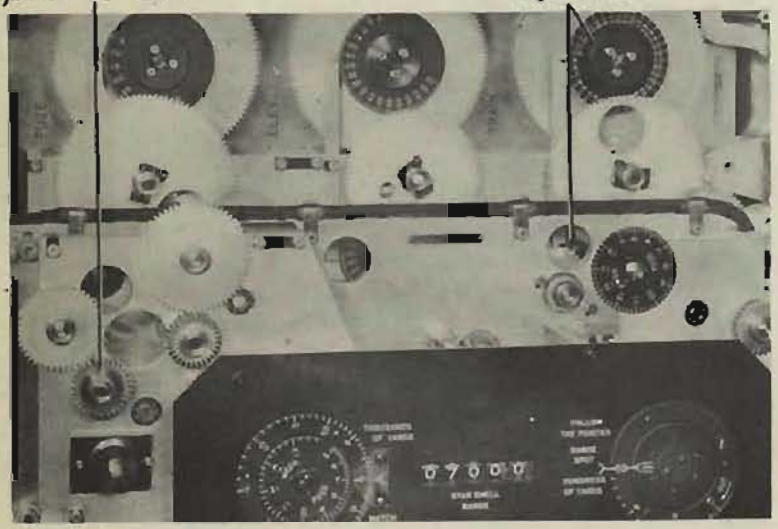
Location

A-12 is under the rear cover.

Check

Turn the power OFF.

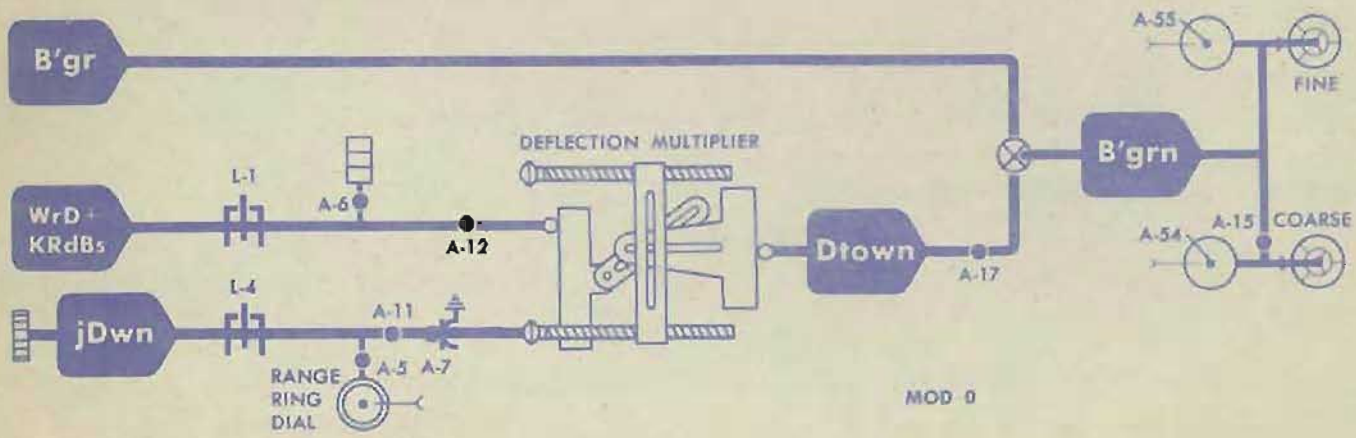
Set the star shell deflection counter at 0 by turning the gearing.
The *WrD + KRdBs* input slide to the deflection multiplier should be positioned so that turning the *jDwn* input gear produces no motion of the output slide.
Wedge the *B'gr* line from Computer Mark 1.
On Mods 1 and 2, wedge the *B'jn* line.
Turn the *jDwn* input gear.
The *B'grn* (*B'grjn* on Mods 1 and 2) dial reading should not change.



Adjustment

If the *B'grn* (or *B'grjn*) reading changes, slip-tighten A-12. Turn the spur gear at A-12 until there is no change in the *B'grn* (or *B'grjn*) dial reading when the *jDwn* input gear is turned through its full travel.

Tighten A-12, and recheck.
Remove the wedges.
Check A-17.



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A-13 FINE to COARSE SYNCHRO— Fn TRANSMITTER

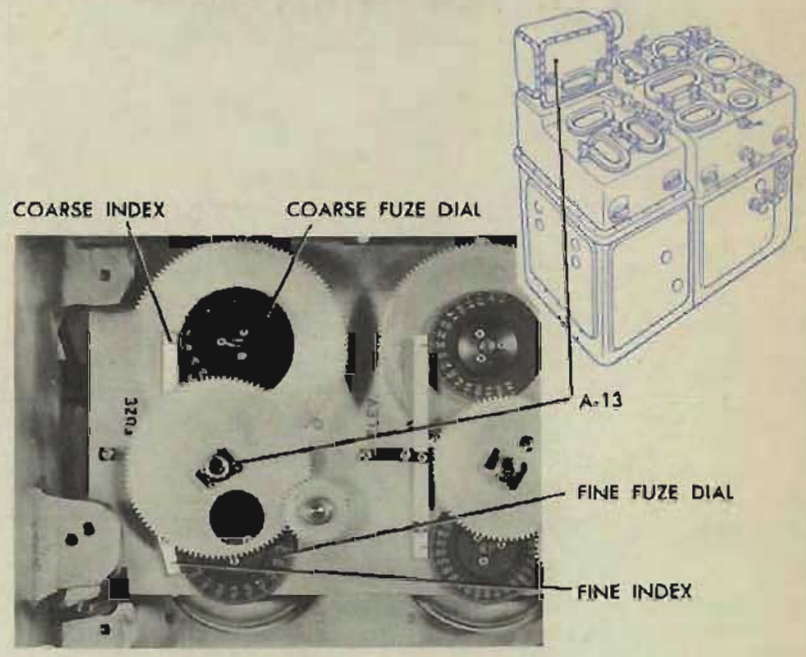
Location

A-13 is under the front cover, in front of the star shell fuze order transmitters.

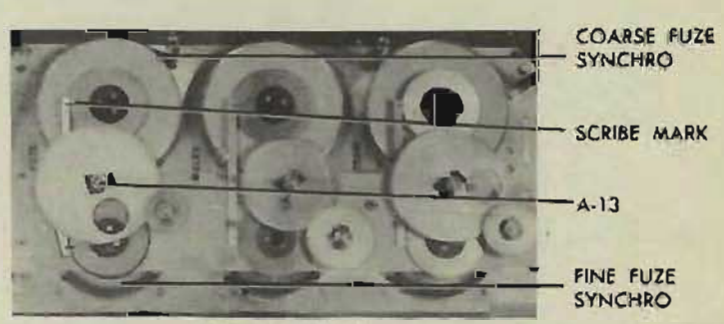
Check

Put the coarse fuze synchro on electrical zero. At that position, on Mod 0 the coarse dial reads 10; on Mods 1 and 2 the scribe mark is at the fixed index.

The fine synchro should also be on electrical zero.
On Mod 0 the fine dial should read 0.0; on Mods 1 and 2 the scribe mark should be at the fixed index.



MOD 0



MODS 1 AND 2

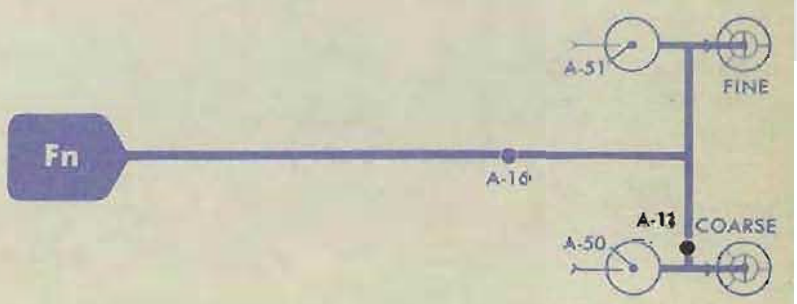
Adjustment

If the fine fuze synchro is not on electrical zero when the coarse synchro is on electrical zero, slip-tighten A-13. Hold the fine synchro on electrical zero, and turn the large spur gear on the coarse synchro until the coarse synchro is also on electrical zero.

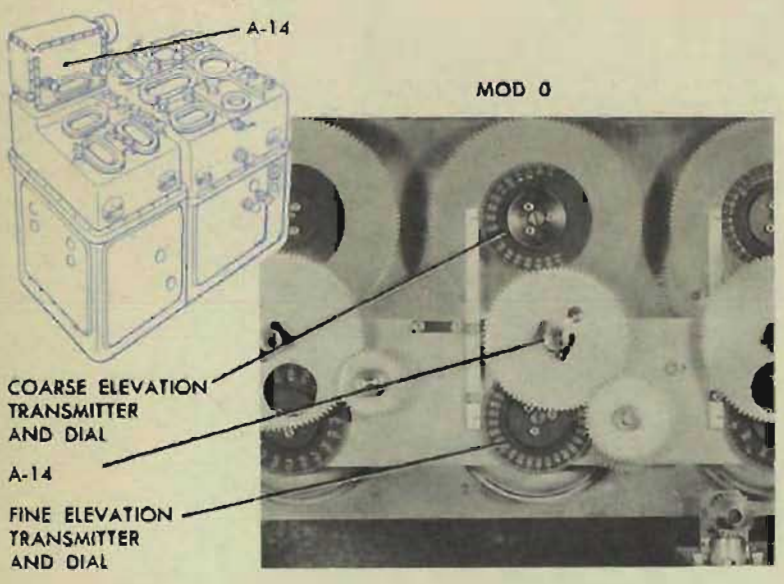
Tighten A-13, and recheck. Check A-16.

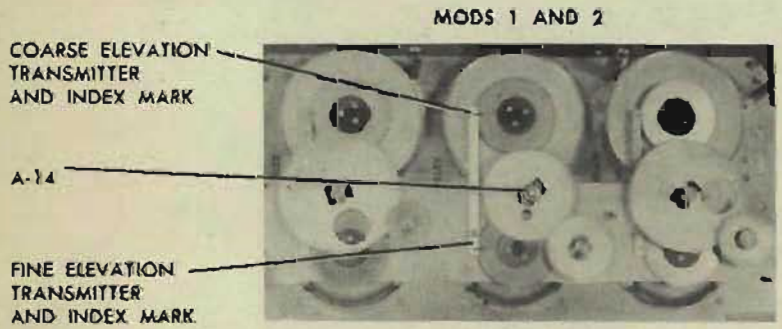
Note

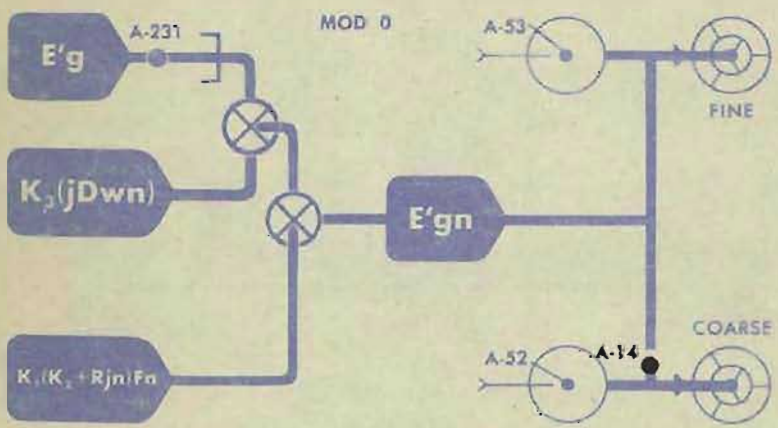
On Mod 0, the fine dial has two graduations marked 0.0 seconds. Use the same graduation in readjusting A-13 that was used for readjusting A-51.



A-14 FINE to COARSE SYNCHRO— E'gn TRANSMITTER







Location

A-14 is under the front cover, in front of the *E'gn* transmitters (*E'gjn* on Mods 1 and 2).

Check

Put the coarse *E'gn* (or *E'gjn*) synchro on electrical zero. At that position, on Mod 0 the coarse dial reads 20; on Mods 1 and 2 the scribe mark is at the fixed index.

The fine synchro should also be on electrical zero. On Mod 0, the fine dial should read 00; on Mods 1 and 2 the fine scribe mark should be at the fixed index.

Adjustment

If the fine synchro is not on electrical zero when the coarse synchro is on electrical zero, slip-tighten A-14. Hold the fine synchro on electrical zero. Turn the large spur gear on the coarse synchro until the coarse synchro is also on electrical zero.

Tighten A-14, and recheck.
Check A-231.

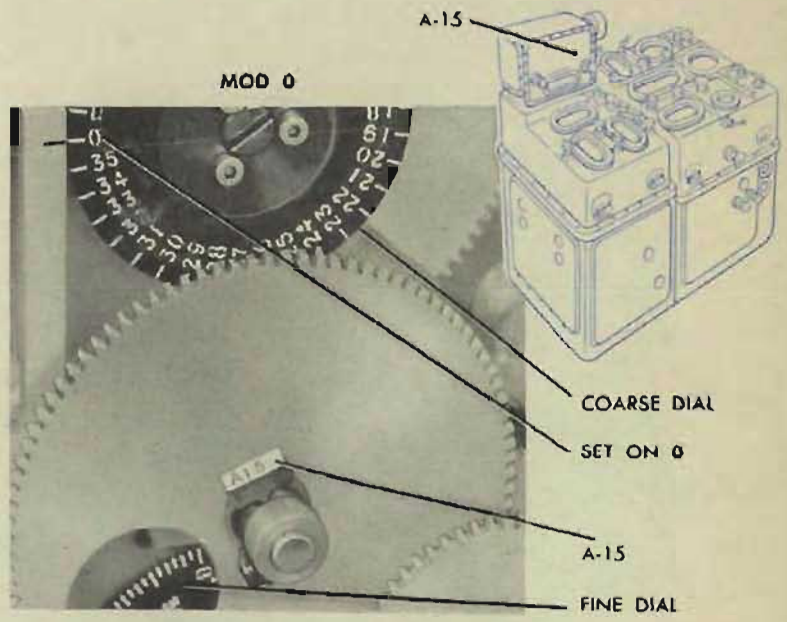
Note

On Mod 0, there are six graduations marked 00 on the fine dial.
In readjusting A-14, use the same graduation that was used for readjusting A-53.

A-15 FINE to COARSE SYNCHRO— B'grn TRANSMITTER

Location

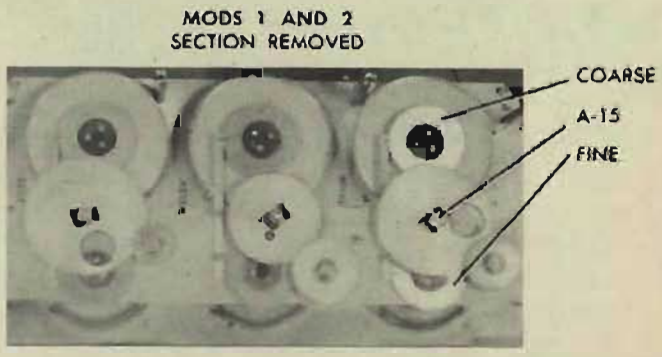
A-15 is under the front cover, in front of the *B'grn* transmitters (*B'grjn* on Mods 1 and 2).



Check

Put the coarse *B'grn* (or *B'grjn*) synchro on electrical zero. At that position, on Mod 0 the coarse dial reads 0; on Mods 1 and 2 the scribe mark is at the fixed index.

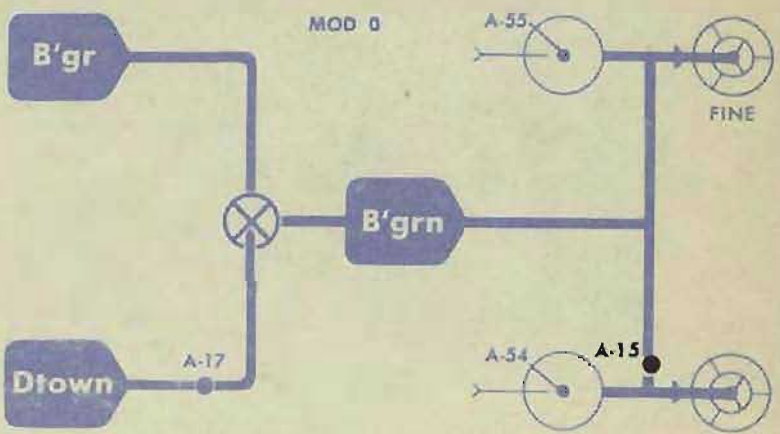
The fine synchro also should be on electrical zero. On Mod 0 the fine dial should read 0; on Mods 1 and 2 the scribe mark should be at the fixed index.



Adjustment

If the fine synchro is not on electrical zero when the coarse synchro is on electrical zero, slip-tighten A-15. Hold the fine synchro on electrical zero and turn the large spur gear on the coarse synchro until the coarse synchro is on electrical zero.

Tighten A-15, and recheck.
Check A-17.



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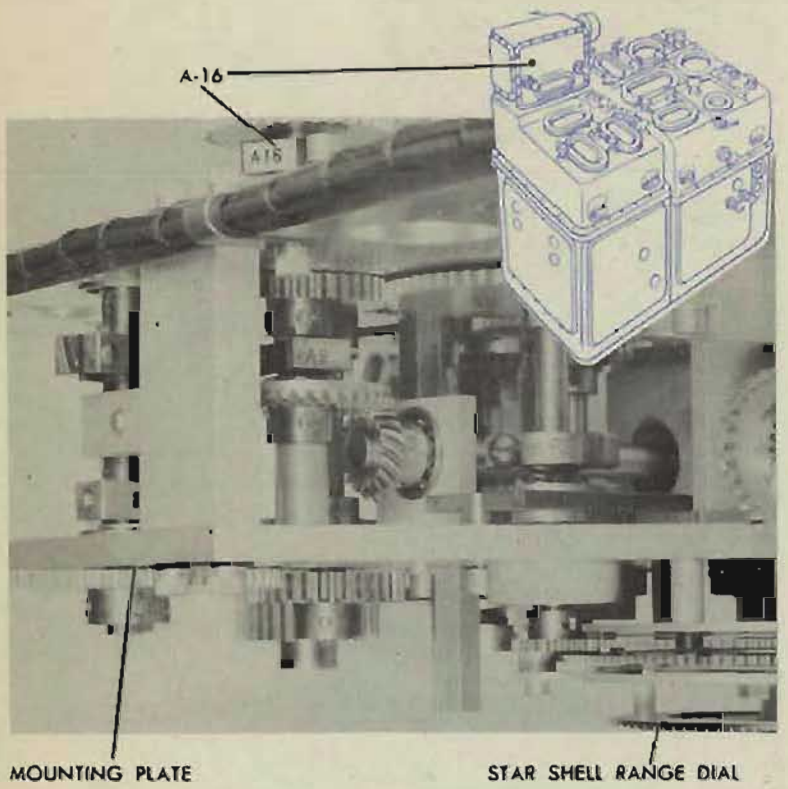
A-16 MOD 0 Fn DIALS to L-3



Location

A-16 is under the front cover, in back of the mounting plate behind the dial mask.

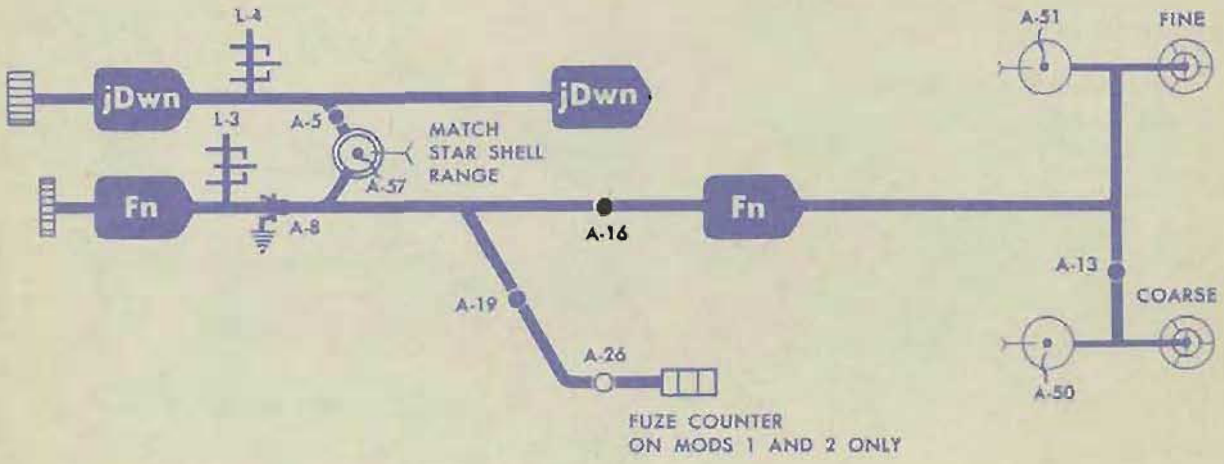
Check

L-3 should operate at 8.20 and 41.55 seconds.
Turn the *Fn* input gear to the lower limit of the stop.
The *Fn* dials should read 8.20 seconds.

Adjustment

If the *Fn* dials do not read 8.20 seconds, loosen A-16.
Hold the *Fn* line against the stop, and turn the large spur gear above A-16 until the dial reading is correct.

Tighten A-16, and check at the upper limit.



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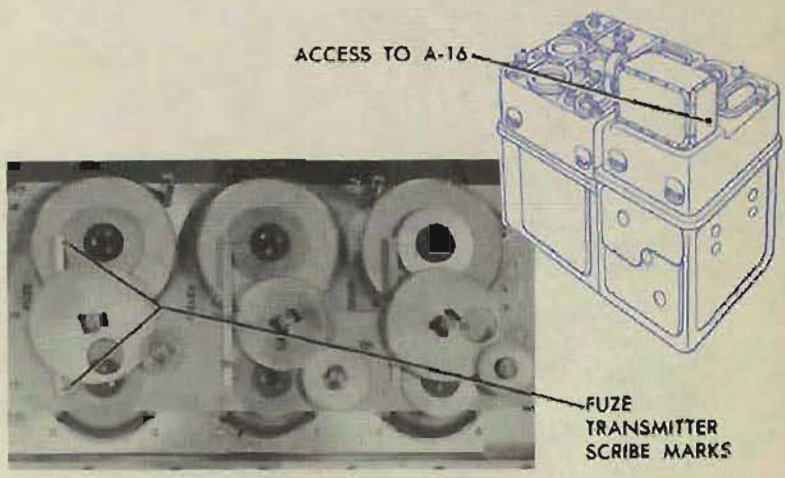
A-16 MODS 1 and 2 Fn TRANSMITTER to Fn COUNTER

Location

A-16 is under the front cover and is accessible through a hole under the junction box cover.



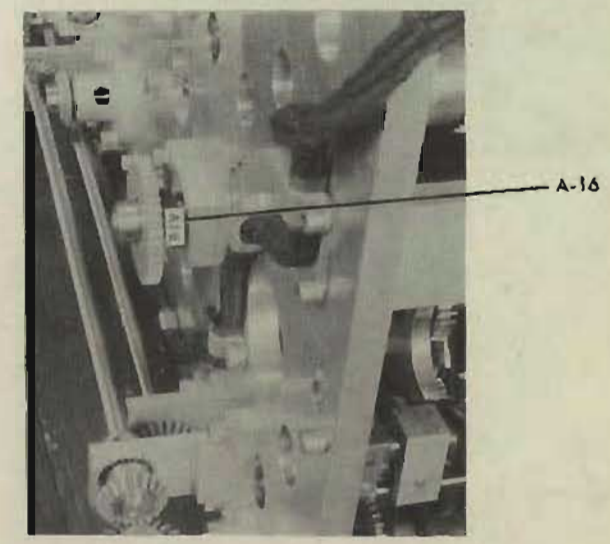
Check

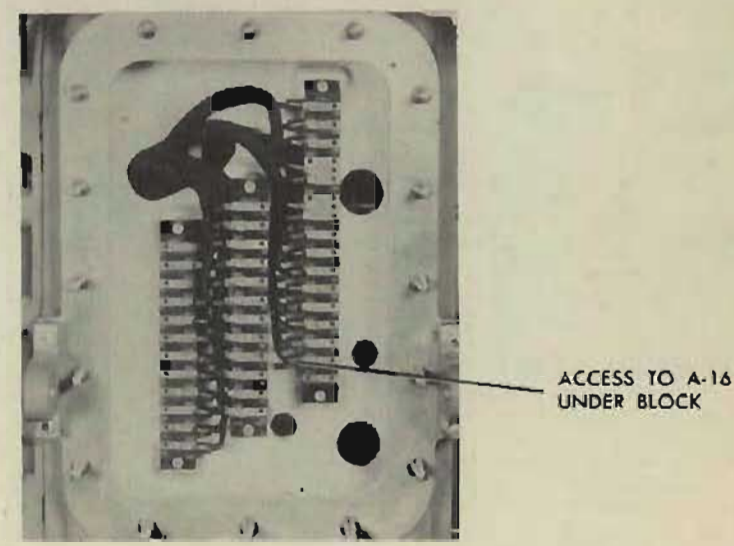
Set the *Fn* counter at 10.00 seconds. The *Fn* transmitter scribe marks should be at the fixed indexes.

Adjustment

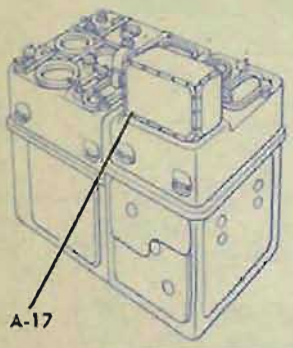
If the *Fn* transmitter scribe marks are not at the fixed indexes, loosen A-16. Hold the counter at 10.00 seconds. Turn the gear on which A-16 is mounted until the transmitter scribe marks are at the index marks.

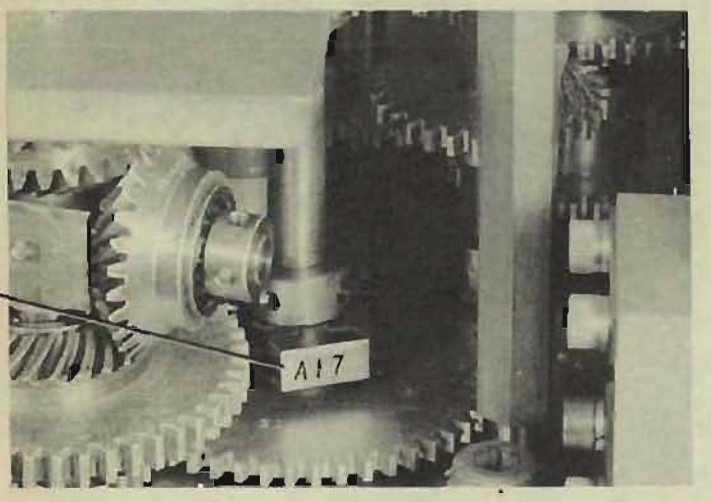
Tighten A-16, and recheck.
Check A-19.





A-17 B'grn DIALS to B'gr DIALS





Location

A-17 is under the rear cover, just above the base plate.

Note

On Mods 1 and 2, check A-23 before readjusting A-17.

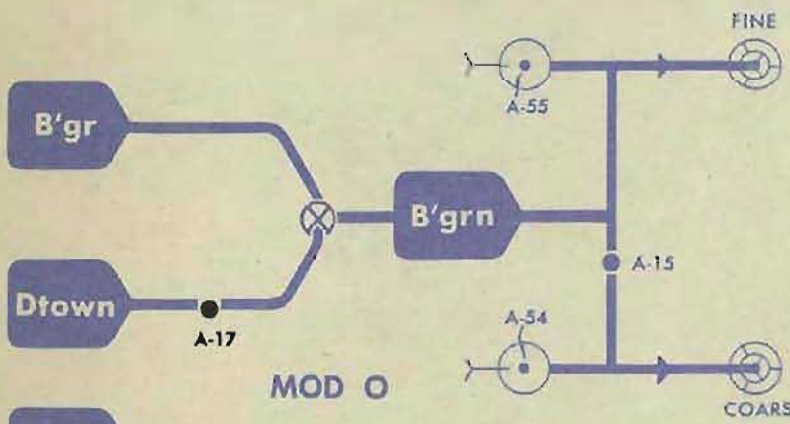
Check

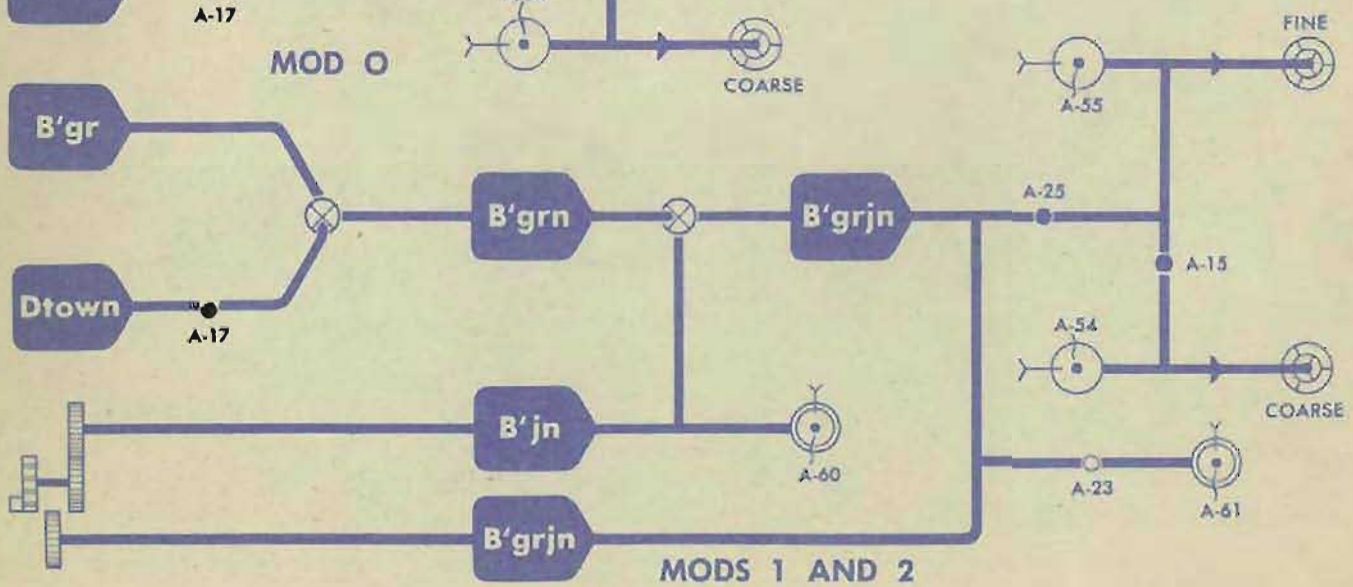
Turn the power OFF.
Set the star shell deflection counter at 0 knots by turning the gearing. On Mods 1 and 2 also set the *B'jn* dials at 0.
The *B'grn* dials (or *B'grjn* dials on Mods 1 and 2) should match the *B'gr* dials.

Adjustment

If the *B'grn* (or *B'grjn*) dials and the *B'gr* dials do not agree, make A-17 slip-tight.
Turn the spur gear below the clamp until the dials agree.
Tighten A-17, and recheck.

On Mods 1 and 2, check A-25.





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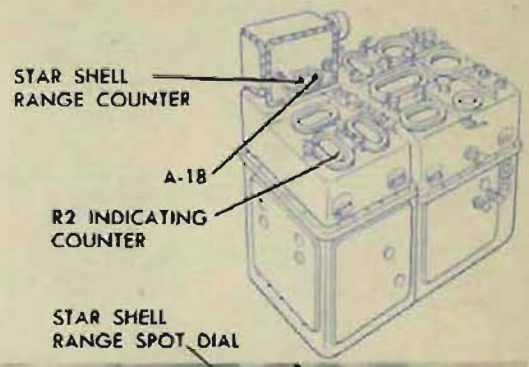
A-18 R2n COUNTER to R2 COUNTER

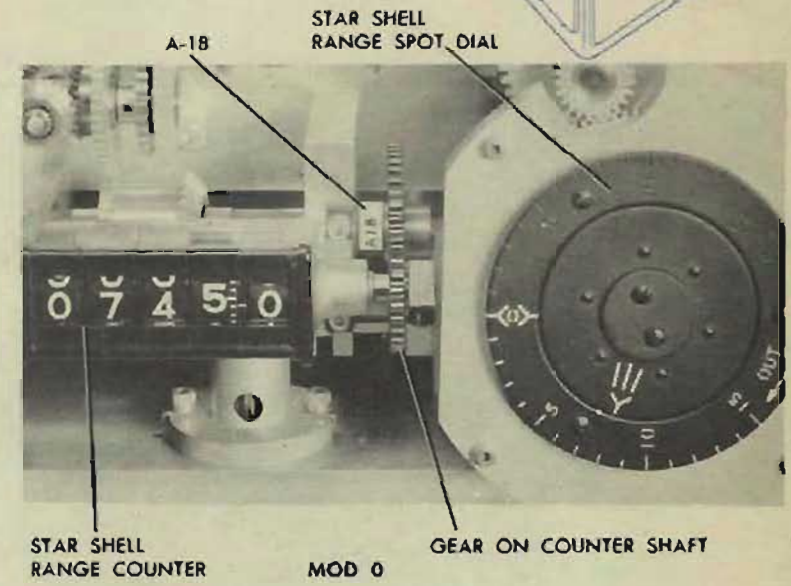
Location

A-18 is under the front cover, on a spur gear next to the star shell range counter.



Check

Set *Rjn* at 0.
The *R2n* counter should read 1,000 yards more than the *R2* counter in the Computer Mark 1.

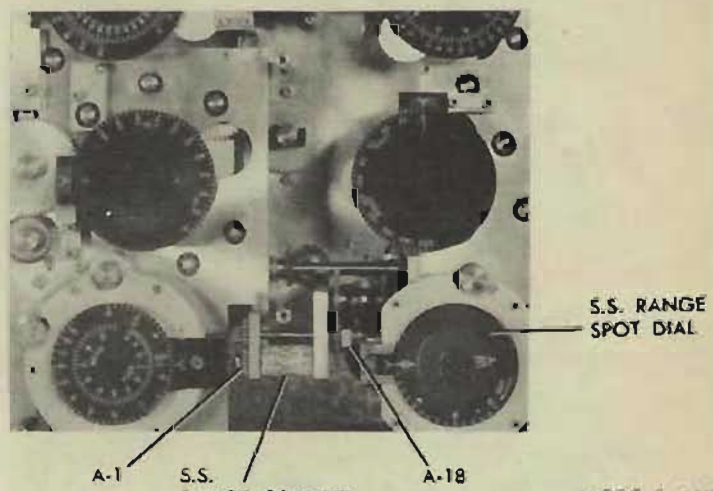


MOD 0

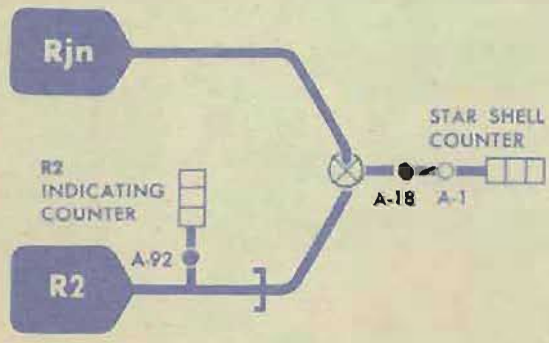
Adjustment

If the *R2n* counter does not read 1,000 yards more than the *R2* counter, loosen A-18. Turn the gear on the counter shaft until the reading is correct.

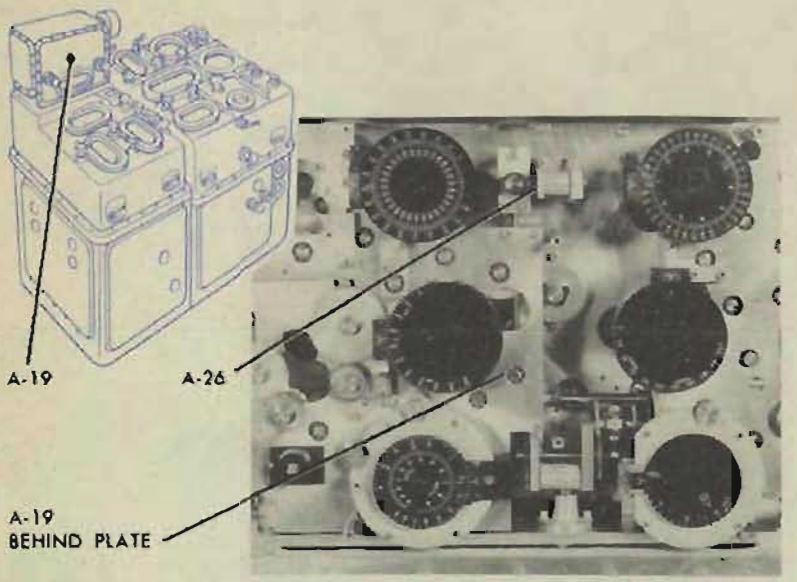
Tighten A-18, and recheck.
Check that assembly clamp A-1 is tight.

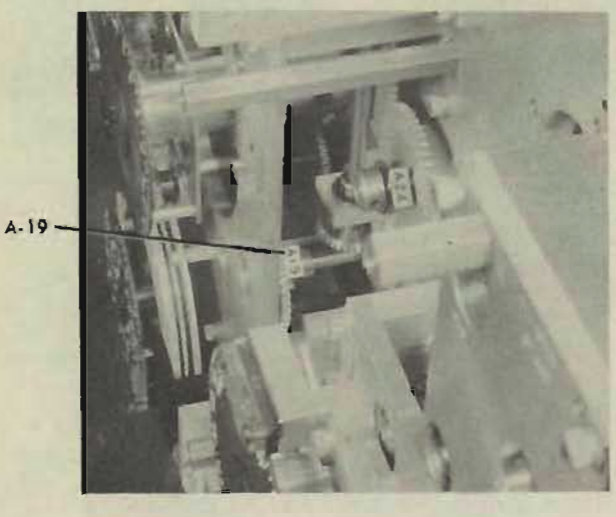


MODS 1 AND 2



A-19 Fn COUNTER to L-3





Location

A-19 is under the front cover, behind the plate to the right of the elevation spot dial.

Check

Decrease *Fn* to the lower limit.
On Mod 1 the *Fn* counter should read 8.20 seconds; on Mod 2, 9.70 seconds.

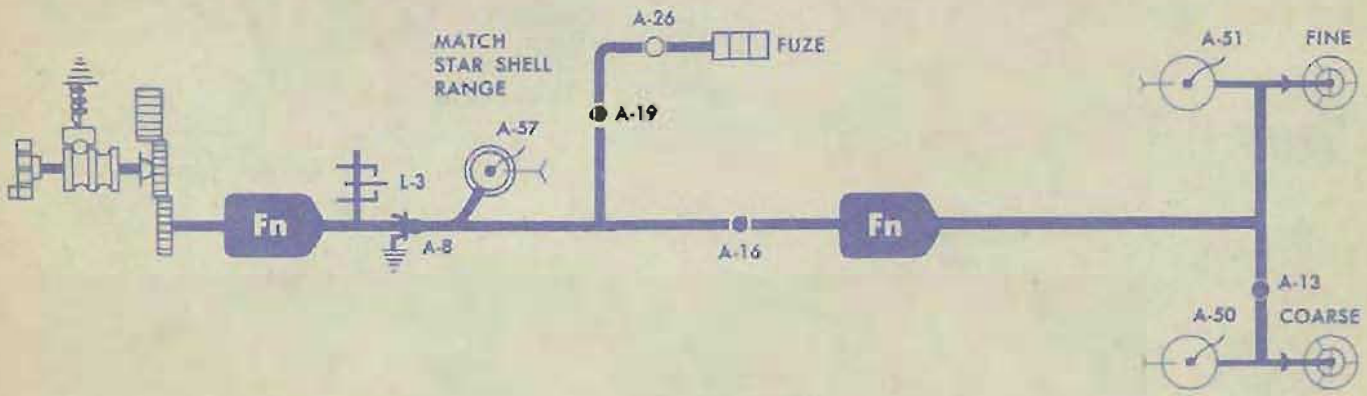
Increase *Fn* to the upper limit.
On Mod 1, the *Fn* counter should read 41.55 seconds; on Mod 2, 46.70 seconds.

Check that A-26 is tight, before readjusting A-19.

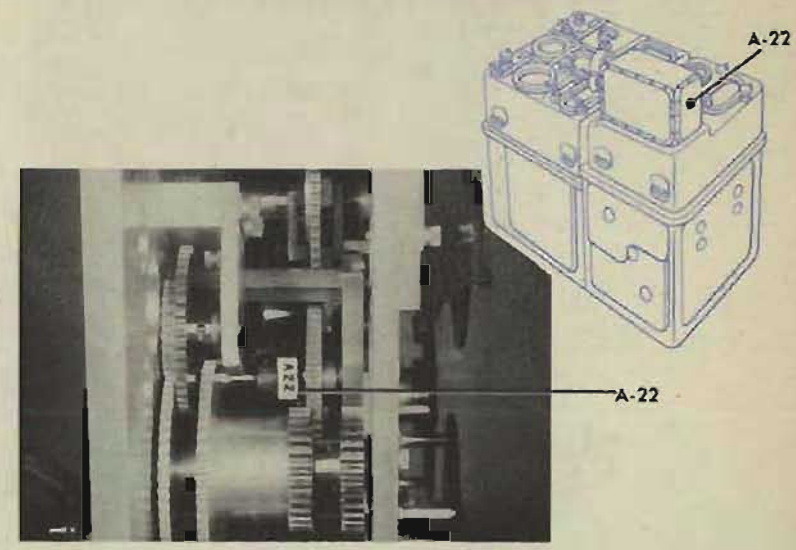
Adjustment

If the *Fn* counter reading is incorrect at either limit, loosen A-19.
Hold the line against the stop and set the counter at the proper reading.

Tighten A-19, and recheck.
Split any overtravel.
Check A-16 and A-57.



A-22 ASSEMBLY CLAMP



Location

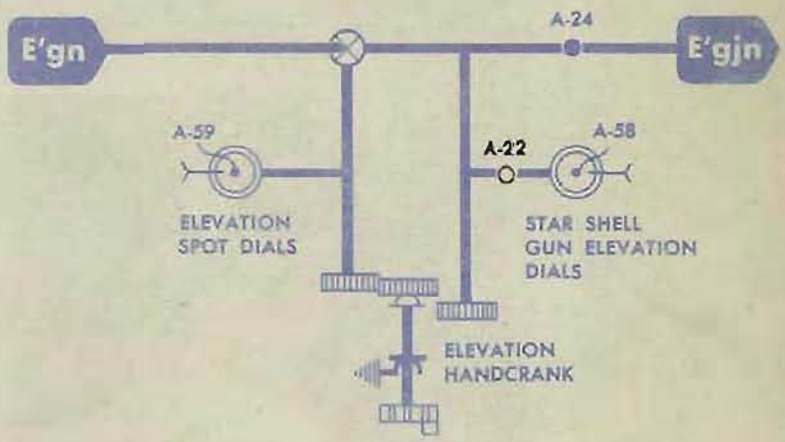
A-22 is under the front cover, behind the plate supporting the *E'gjn* dials. It is accessible through a hole under the junction box cover.

Check

A-22 should be tight.

Adjustment

Tighten A-22.
Check A-24 and A-231.



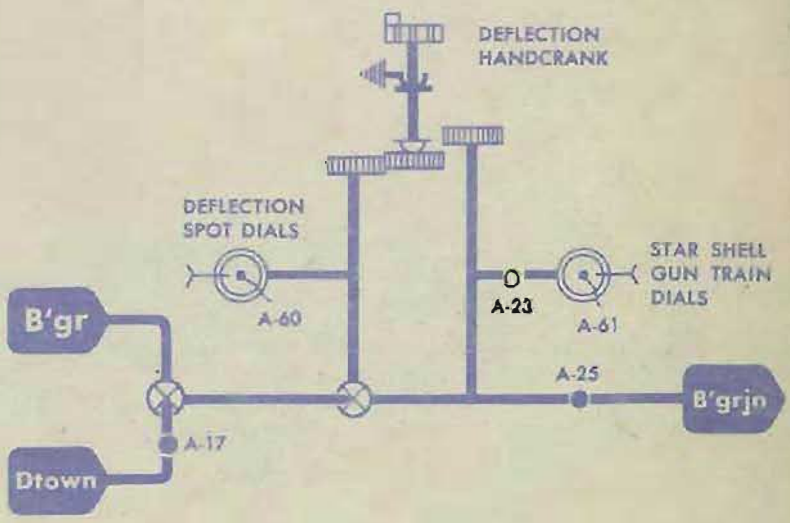
A-23 ASSEMBLY CLAMP

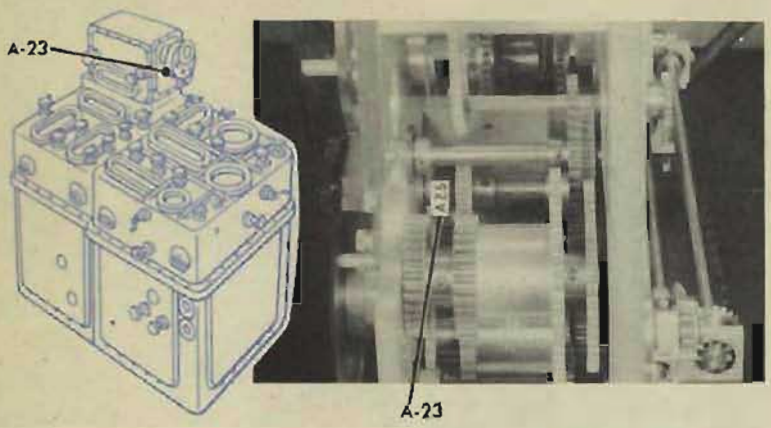
Location

A-23 is under the front cover, behind the plate supporting the *B'grjn* dials. It is accessible through a hole on the right side.

Check

A-23 should be tight.



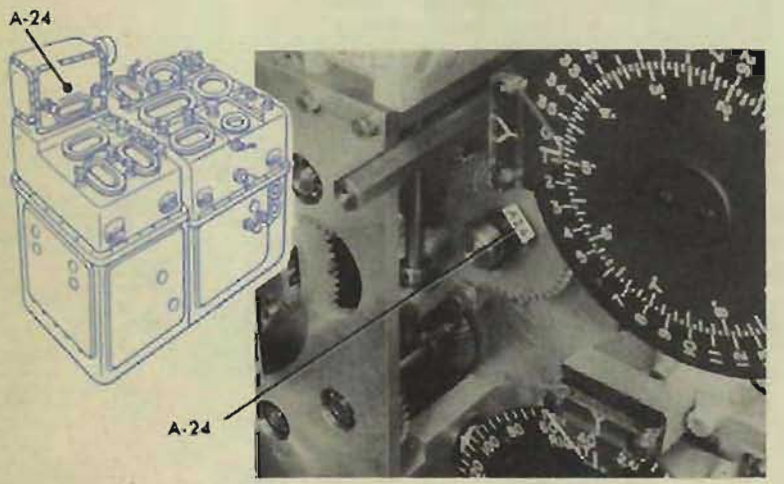


Adjustment

Tighten A-23.

Check A-25 and A-17.

A-24 E'gjn TRANSMITTER to E'gjn DIALS



Location

A-24 is under the front cover, below the *Fn* counter.

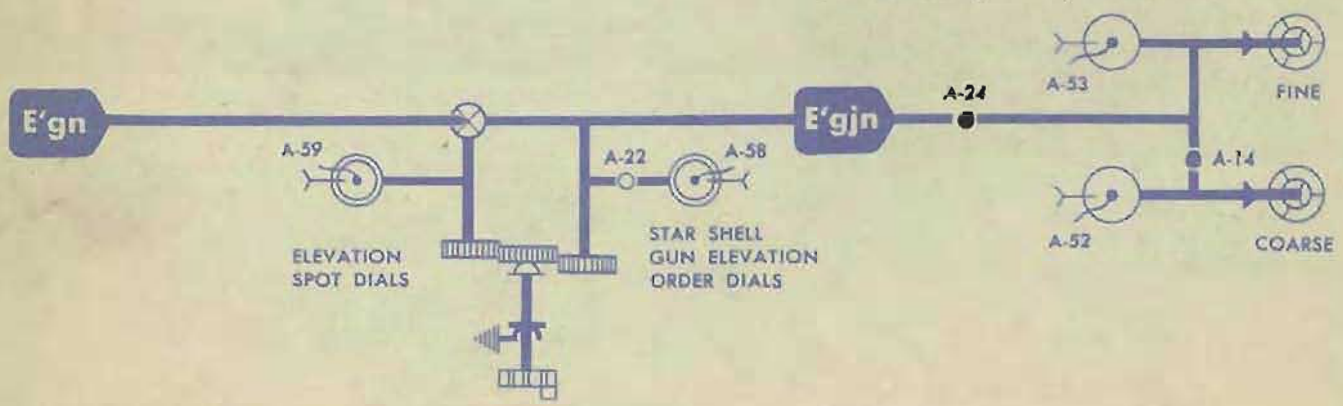
Check

Set the *E'gjn* dials at 2000'.
The scribe marks on the fine and coarse transmitter dials should match the fixed indexes.
Check that A-22 is tight, before re-adjusting A-24.

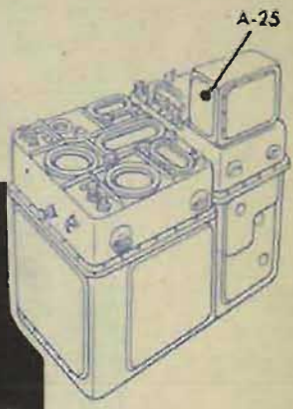
Adjustment

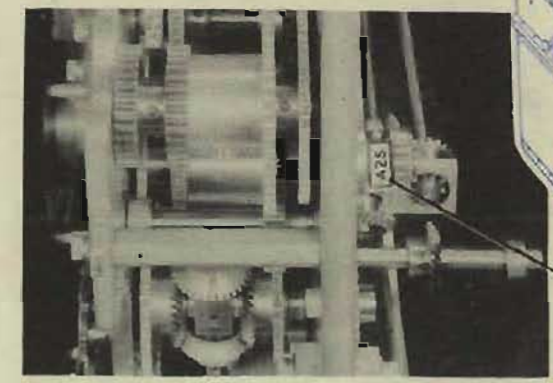
If the scribe marks do not match the fixed indexes, loosen A-24.
Turn the transmitter gearing to align the scribe marks at the fixed indexes.

Tighten A-24, and recheck.
Check A-52, A-53, and A-14.



A-25 B'grjn TRANSMITTER to B'grjn DIALS



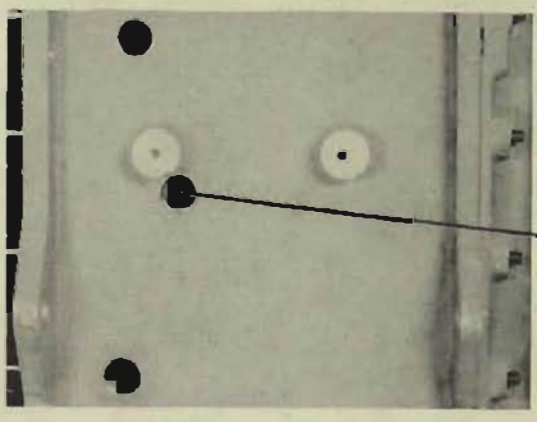


Location

A-25 is accessible through a hole at the right side.

Check

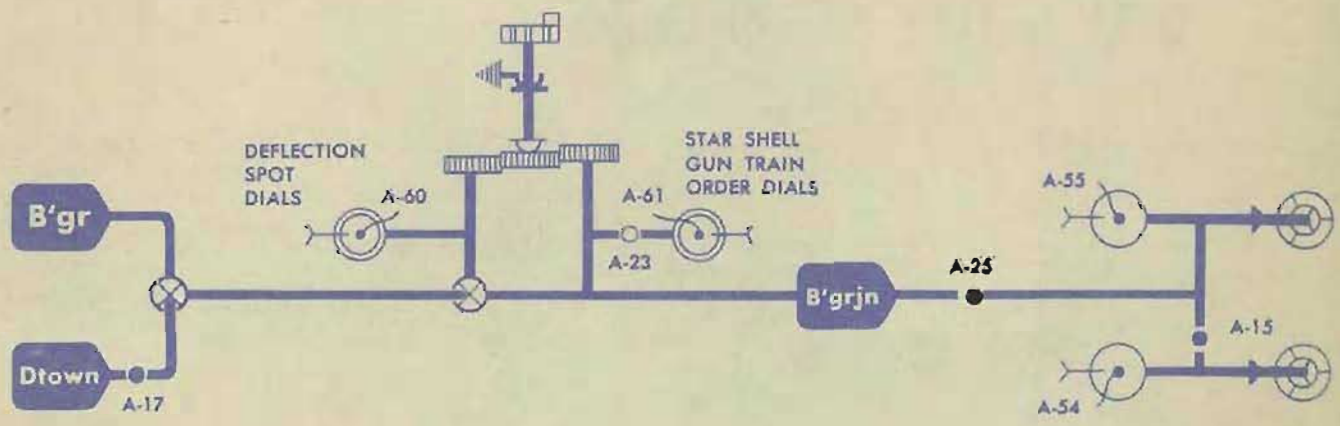
Set the *B'grjn* dials at 0°.
The scribe marks on the fine and coarse transmitter dials should match the fixed indexes.
Check that A-23 is tight before re-adjusting A-25.



Adjustment

If the scribe marks do not match the fixed indexes, loosen A-25. Turn the transmitter gearing to align the scribe marks at the fixed indexes.

Tighten A-25, and recheck.
Check A-54, A-55, and A-15.



A-26 ASSEMBLY CLAMP (see A-19)

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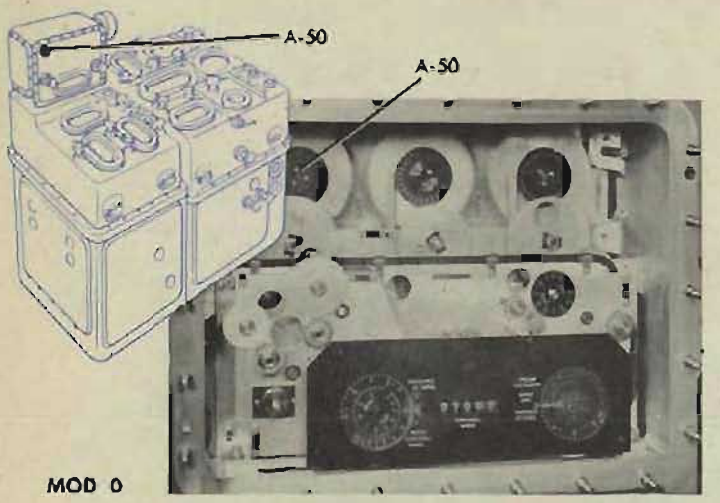
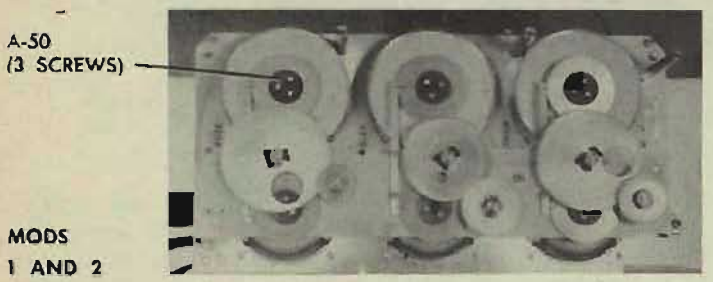
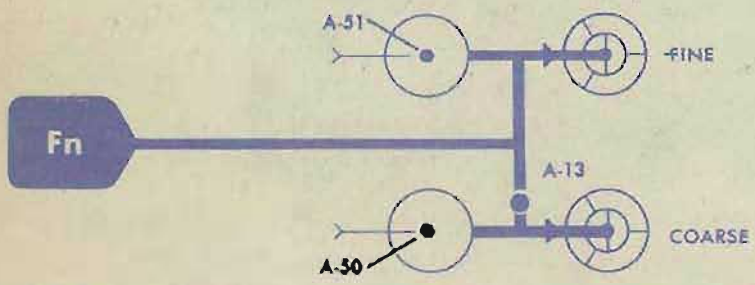
A-50 DIAL to COARSE Fn SYNCHRO







Location

A-50 is under the front cover, on the coarse *Fn* transmitter dial.
On Mods 1 and 2, A-50 is accessible only after the transmitter section is removed from the star shell computer.

Check

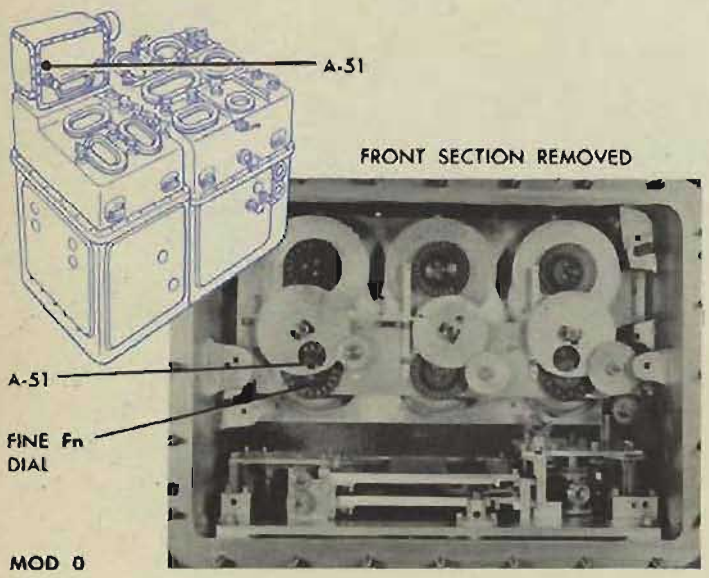
Set the coarse *Fn* synchro at electrical zero.
On Mod 0, the coarse *Fn* dial should read 10 seconds. On Mods 1 and 2, the scribe mark should be at the fixed index.

Adjustment

If the coarse *Fn* dial does not read 10 seconds, or the scribe mark is not at the fixed index, loosen A-50. Slip the dial to the correct position.

Tighten A-50 and recheck.
Check A-13 and A-16.

A-51 DIAL to FINE Fn SYNCHRO



Location

A-51 is under the front cover, on the fine *Fn* transmitter dial.

Check

Set the fine *Fn* synchro at electrical zero.
On Mod 0, the fine *Fn* dial should read 0.00 seconds. On Mods 1 and 2, the scribe mark should be at the fixed index.

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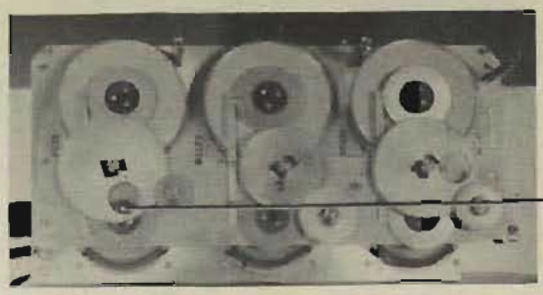
Adjustment

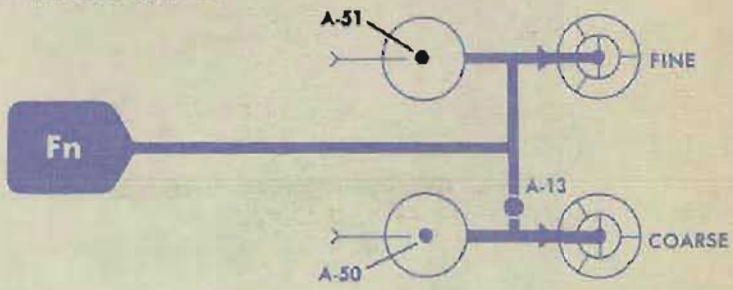
If the fine *Fn* dial does not read 0.00, or the scribe mark is not at the fixed index, loosen A-51. Slip the dial to the correct position.

Tighten A-51 and recheck.

Check A-13 and A-16.



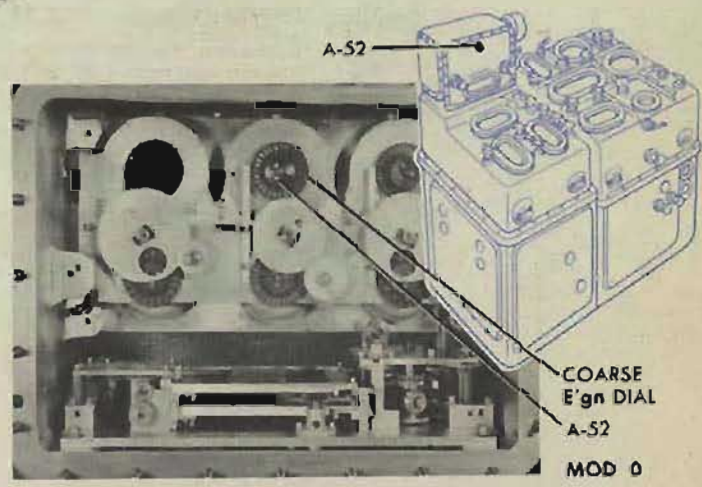
SECTION REMOVED



A-52 DIAL to COARSE E'gjn SYNCHRO

Location

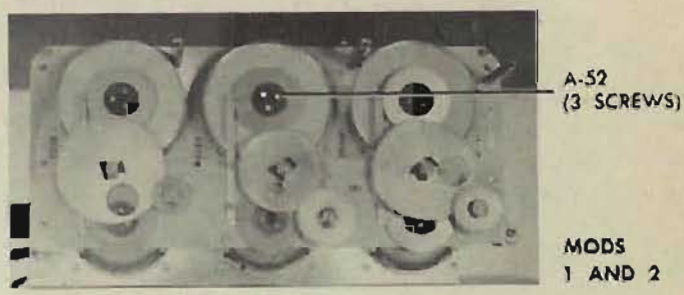
A-52 is under the front cover, on the coarse *E'gjn* transmitter.



FRONT SECTION REMOVED

Check

Set the coarse *E'gjn* synchro at electrical zero.
On Mod 0, the coarse *E'gn* dial should read 20. On Mods 1 and 2, the scribe mark should be at the fixed index.



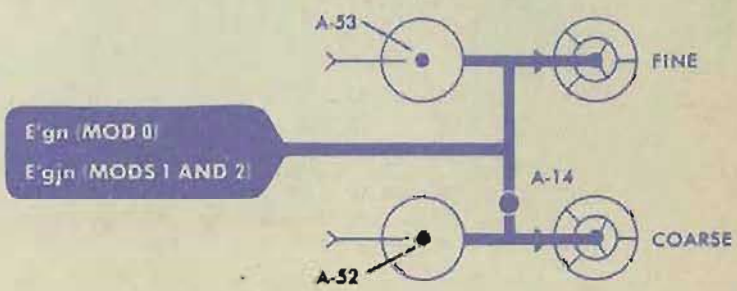
SECTION REMOVED

Adjustment

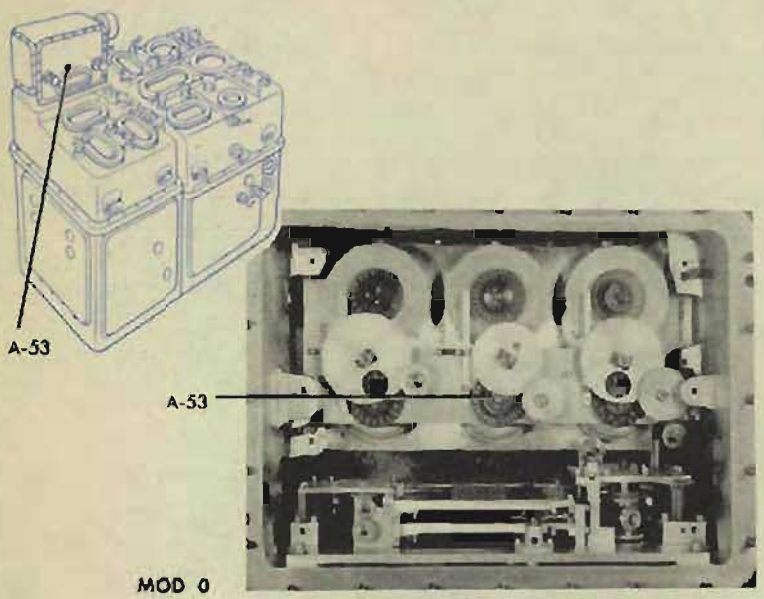
If the coarse *E'gn* dial does not read 20, or the scribe mark is not at the fixed index, loosen A-52. Slip the dial to the correct position.

Tighten A-52 and recheck.

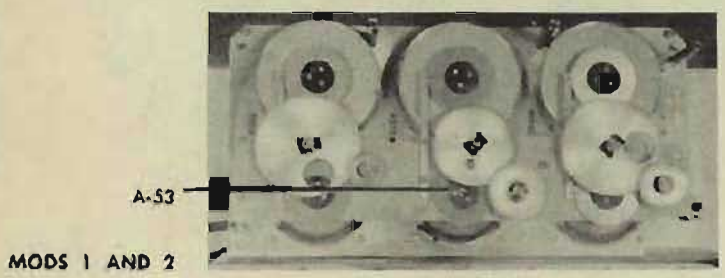
Check A-14.



A-53 DIAL to FINE E'gjn SYNCHRO



FRONT SECTION REMOVED



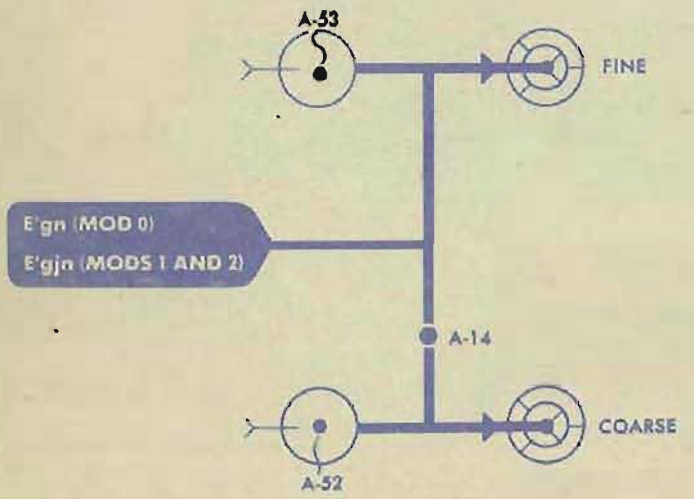
SECTION REMOVED

Location

A-53 is under the front cover, on the fine *E'gjn* transmitter dial.

Check

Set the fine *E'gjn* synchro at electrical zero.
On Mod 0, the fine *E'gn* dial should read 00. On Mods 1 and 2, the scribe mark should be at the fixed index.



Adjustment

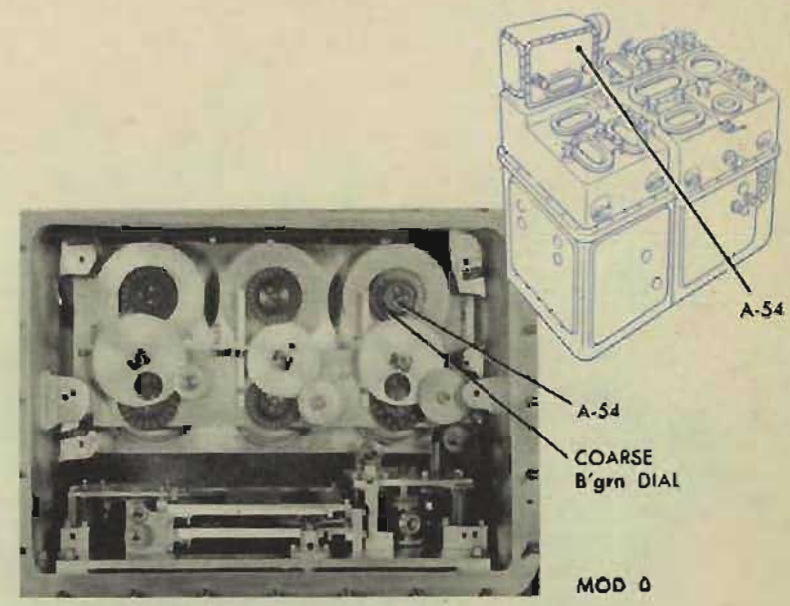
If the fine *E'gn* dial does not read 00 or the scribe mark is not at the fixed index, loosen A-53. Slip the dial to the correct position.

Tighten A-53 and recheck.
Check A-14.

A-54 DIAL to COARSE B'grjn SYNCHRO

Location

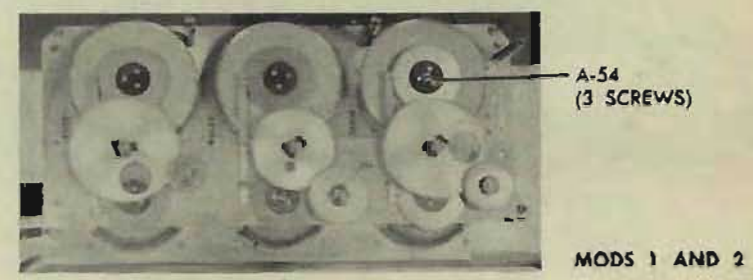
A-54 is under the front cover, on the coarse *B'grjn* transmitter dial.



FRONT SECTION REMOVED

Check

Set the coarse *B'grjn* synchro at electrical zero.
On Mod 0, the coarse *B'grn* dial should read 0. On Mods 1 and 2, the scribe mark should be at the fixed index.

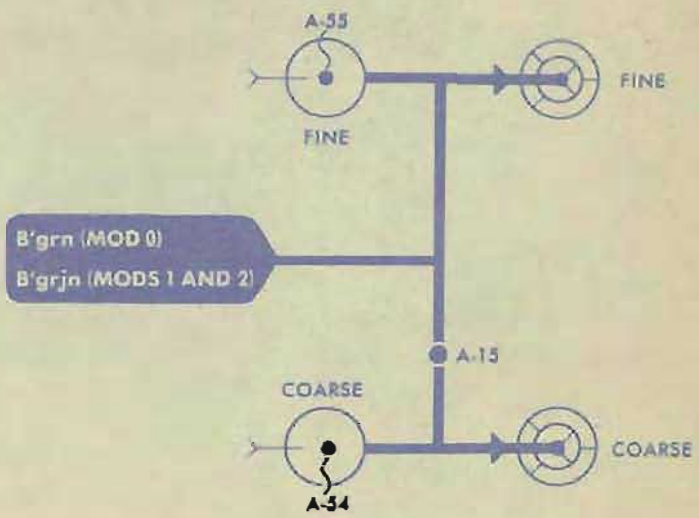


SECTION REMOVED

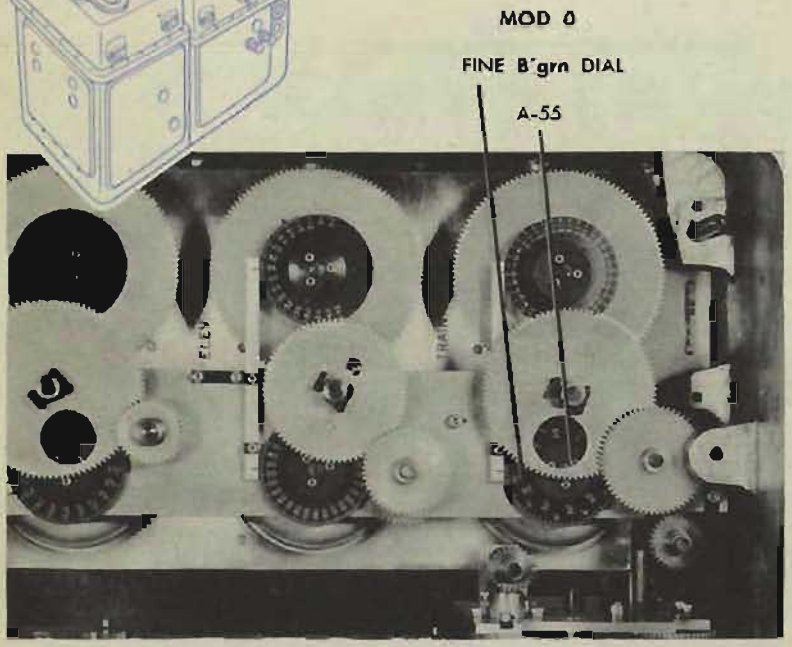
Adjustment

If the coarse *B'grn* dial does not read 0, or the scribe mark is not at the fixed index, loosen A-54. Slip the dial to the correct position.

Tighten A-54, and recheck.
Check A-15.



A-55 DIAL to FINE B'grjn SYNCHRO

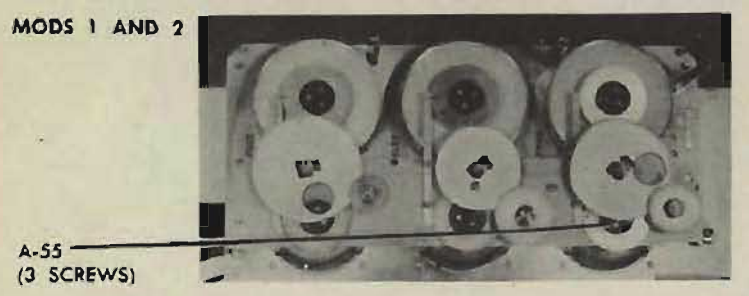


Location

A-55 is under the front cover, on the fine *B'grjn* transmitter dial.

Check

Set the fine *B'grjn* synchro at electrical zero.
On Mod 0 the fine *B'grn* dial should read 0°. On Mods 1 and 2, the scribe mark should be at the fixed index.

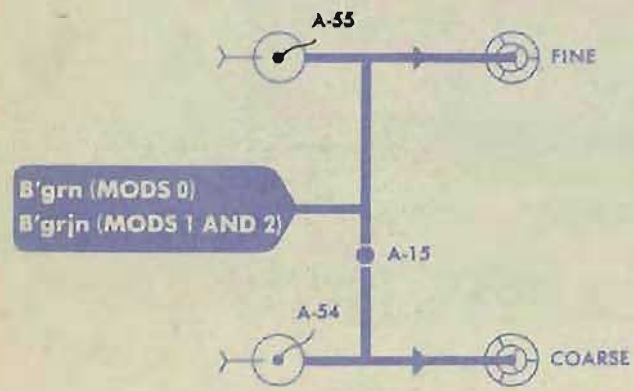


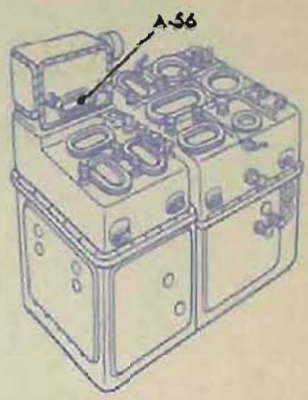
Adjustment

If the fine *B'grn* dial does not read 0°, or the scribe mark is not at the fixed index, loosen A-55. Slip the dial to the correct position.

Tighten A-55, and recheck.

Check A-15.





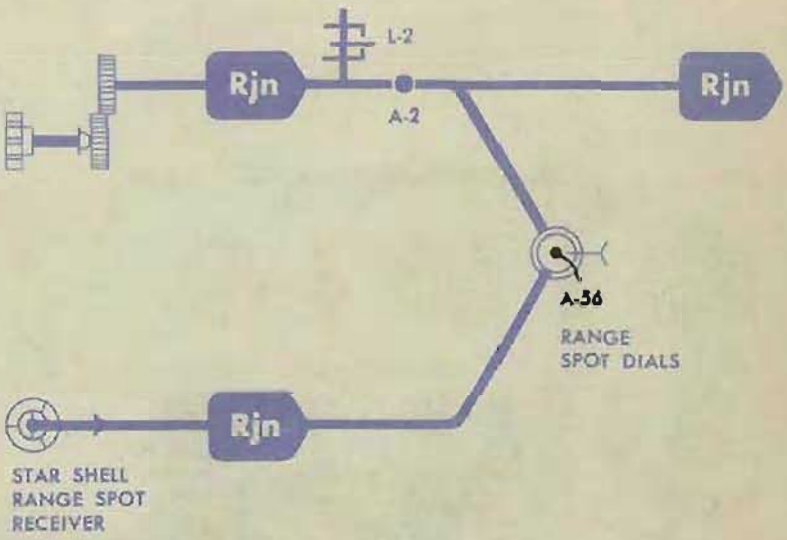
A-56 DIAL to Rjn SYNCHRO

Location

A-56 is under the front cover, on the inner *Rjn* dial.

Check

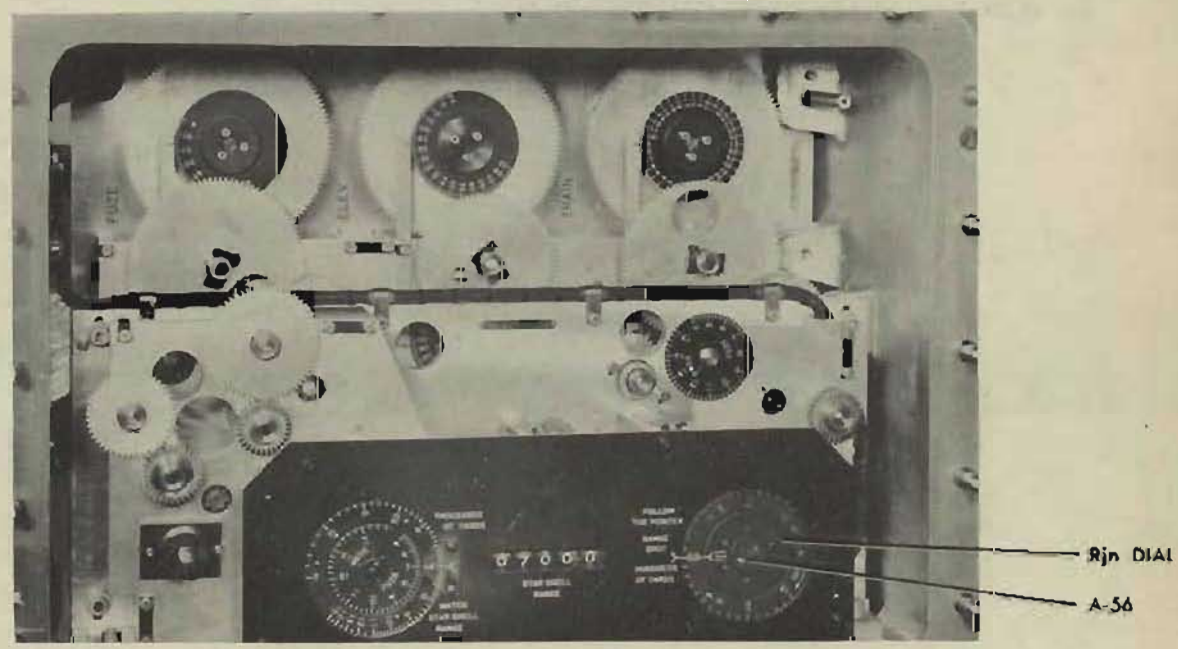
Set the *Rjn* synchro at electrical zero. The pointer on the inner *Rjn* dial should match the fixed index.



Adjustment

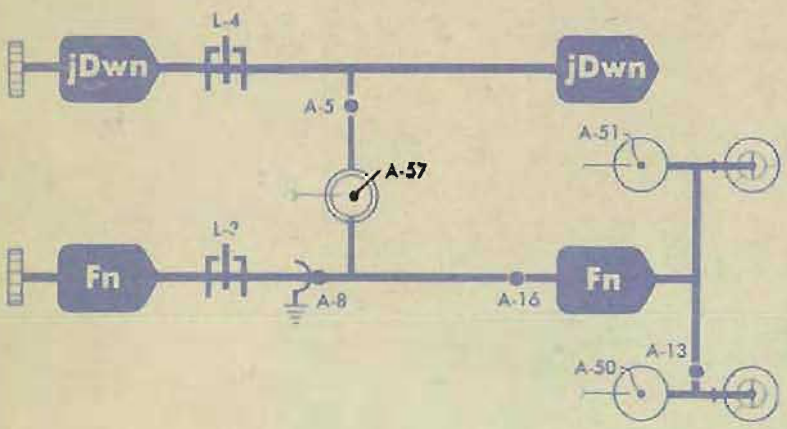
If the pointer on the *Rjn* dial does not match the fixed index, loosen A-56. Slip the dial to the correct position.

Tighten A-56, and recheck.

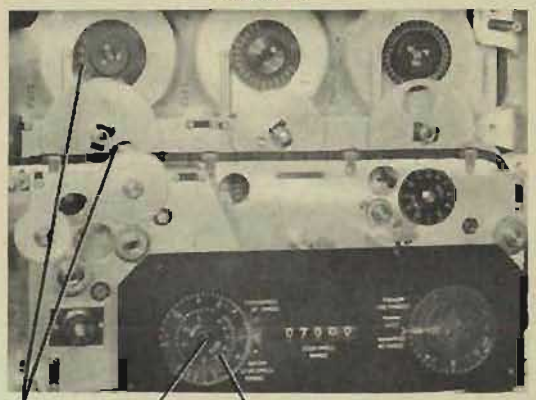


A-57 FUZE RANGE DIAL to Fn DIALS

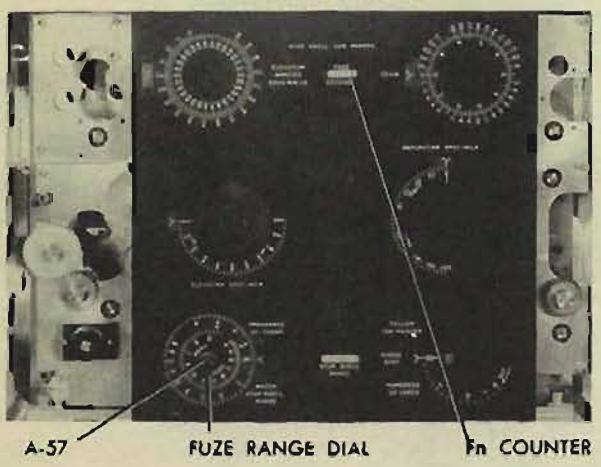
MOD 0



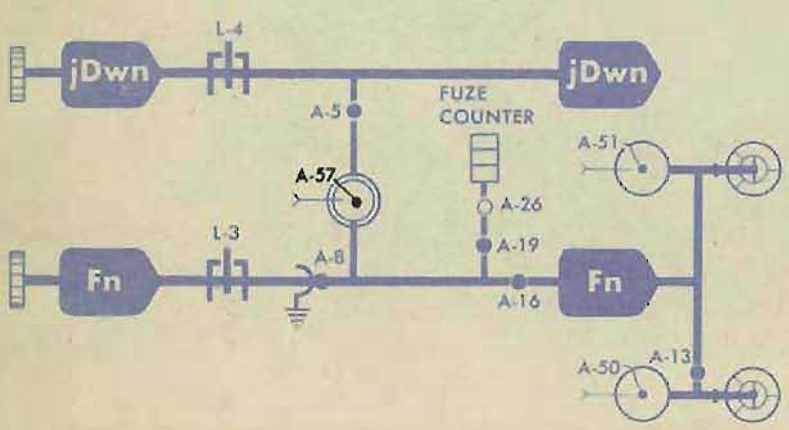
MOD 0



MODS 1 AND 2



MODS 1 AND 2



Location

A-57 is under the front cover, on the fuze range dial.

Check

For powder fuze, Mod 0:
Set the *Fn* dials at 10.60 seconds. The fuze range dial should read 5,000 yards.

For mechanical fuze, Mod 0:
Set the *Fn* dials at 14.50 seconds. The fuze range dial should read 7,600 yards.

For mechanical fuze, Mod 1:
Set the *Fn* counter at 14.50 seconds. The fuze range dial should read 7,600 yards.

For mechanical fuze, Mod 2:
Set the *Fn* counter at 20.02 seconds. The fuze range dial should read 12,000 yards.

Adjustment

If the fuze range dial does not read the correct value, loosen A-57. Slip the dial to the correct reading.

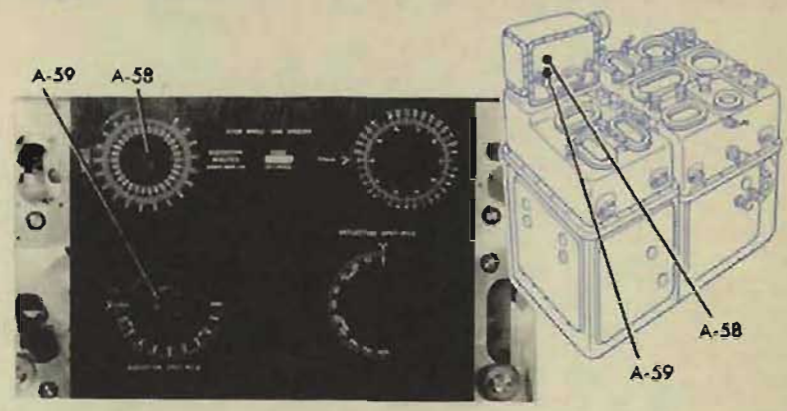
Tighten A-57, and recheck.

Readjust A-231.

A-58 FINE to COARSE E'gjn DIAL

Location

A-58 is under the front cover, on the fine *E'gjn* dial.



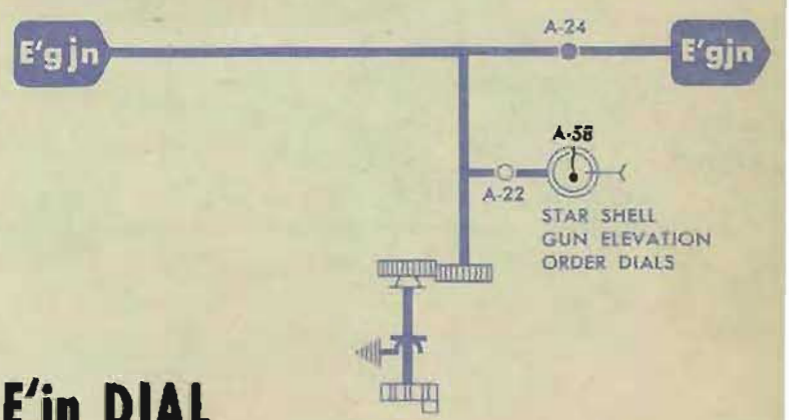
Check

When the ring dial is at 20, the fine inner dial should be at 00. (Any one of the six 00 graduations may be used.)

Adjustment

If the inner dial is not at 00, loosen A-58. Slip the inner dial to read 00.

Tighten A-58, and recheck.
Check A-24 in the star shell computer, and A-231 in Computer Mark 1.



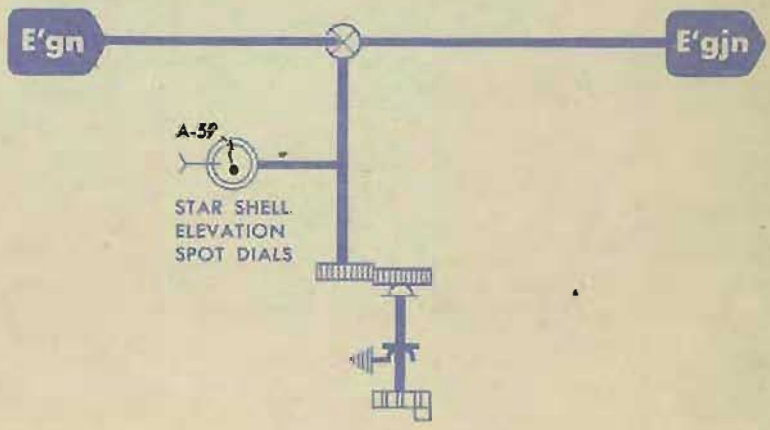
A-59 COARSE to FINE E'jn DIAL

Location

A-59 is under the front cover, on the coarse *E'jn* dial.

Check

Set the 0 of the ring dial at the fixed index.
The center graduation on the inner dial should match the fixed index.



Adjustment

If the center graduation on the inner dial does not match the fixed index, loosen A-59. Slip the dial to the correct position.

Tighten A-59, and recheck.

Check A-231 in Computer Mark 1.

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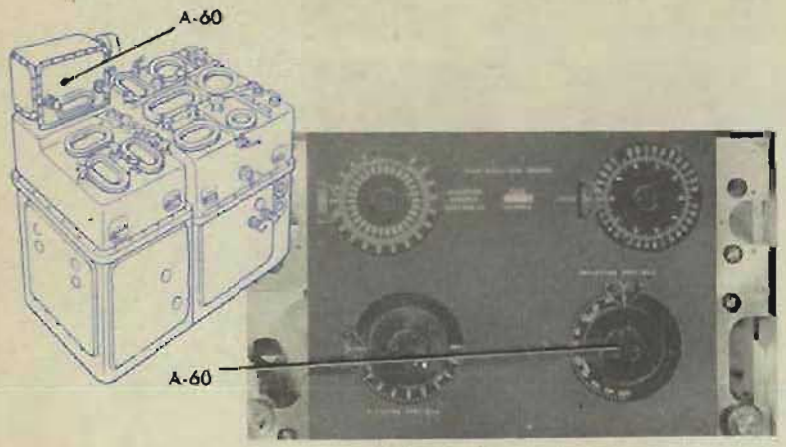
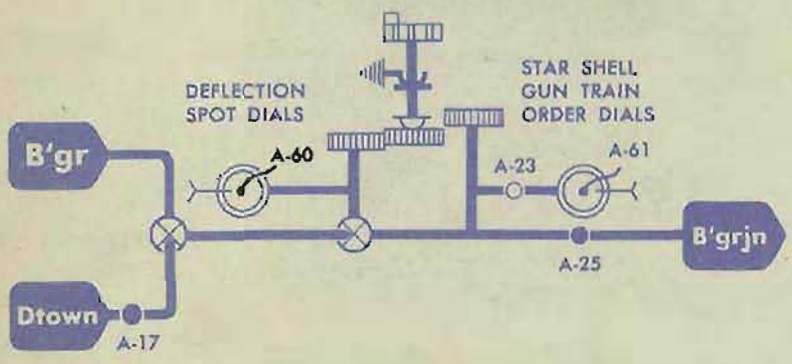
A-60 COARSE to FINE B'jn DIAL





Location

A-60 is under the front cover, on the coarse *B'jn* dial.

Check

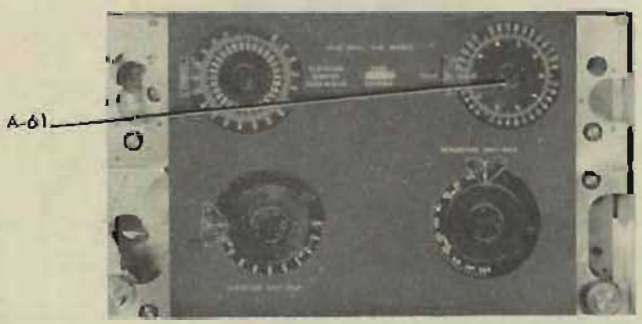
Set the 0 of the *B'jn* ring dial at the fixed index.
The center graduation of the inner dial should match the fixed index.

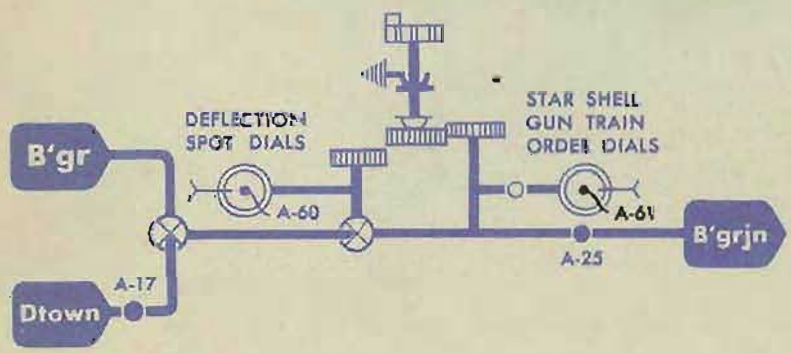
Adjustment

If the center graduation does not match the fixed index, loosen A-60. Slip the dial to the correct position.

Tighten A-60, and recheck.
Check A-17.

A-61 FINE to COARSE B'grjn DIAL





Location

A-61 is under the front cover, on the fine *B'grjn* dial.

Check

When the coarse dial is at 0, the fine dial should also be at 0.

Adjustment

If the fine dial is not at 0, loosen A-61. Slip the fine dial to the correct position.

Tighten A-61, and recheck.
Check A-25 and A-17.

A-230 SYNCHRONIZING THE STAR SHELL DEFLECTION FOLLOW-UP

Location

A-230 is under cover 3 of Computer Mark 1.

Check

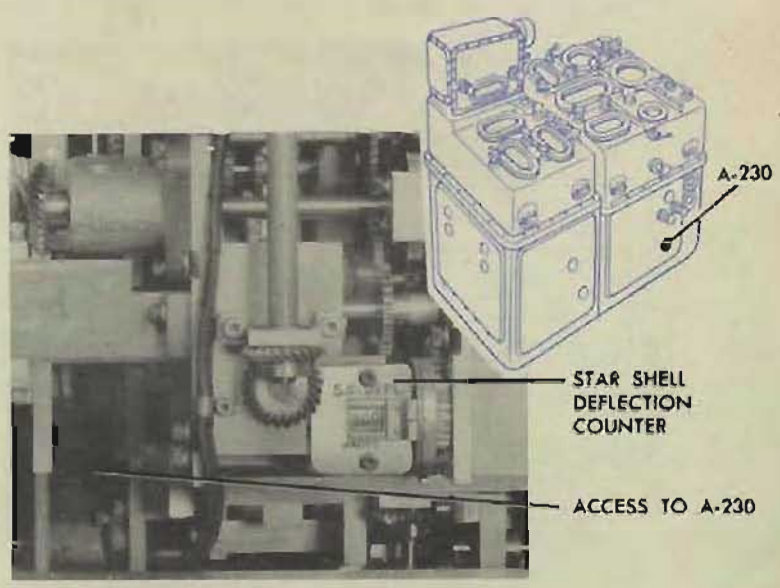
Turn the power ON.

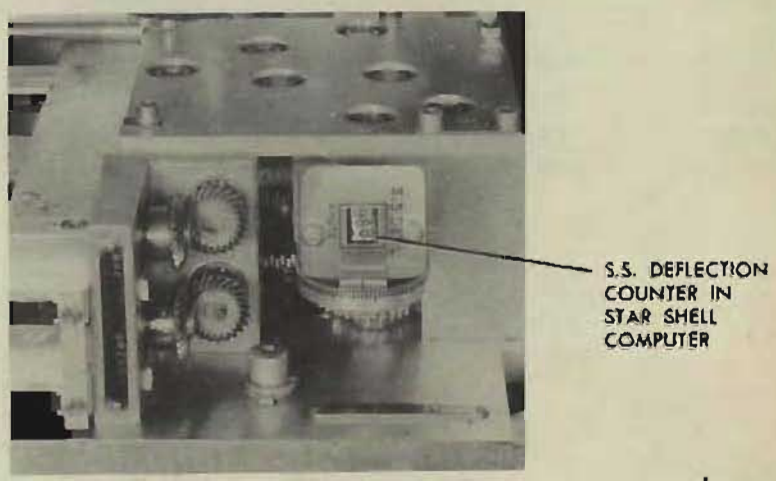
Set *Sw*, *So*, and *Sh* at 0 knots.
The star shell deflection counter in the star shell computer and the star shell deflection counter in Computer Mark 1 should both read 0 knots.

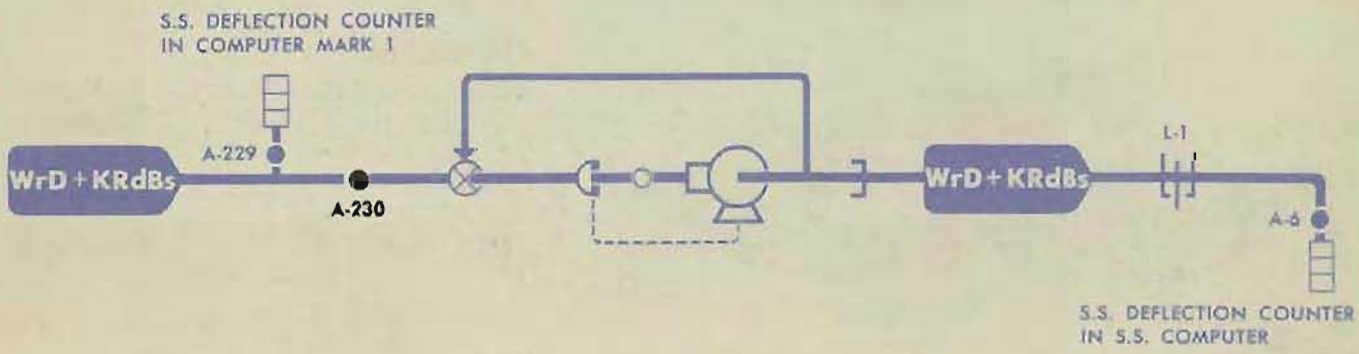
Adjustment

If the counters do not agree, slip-tighten A-230.
Turn the coupling at the rear of A-230 to resynchronize the follow-up until the two counter readings agree.

Tighten A-230, and recheck.







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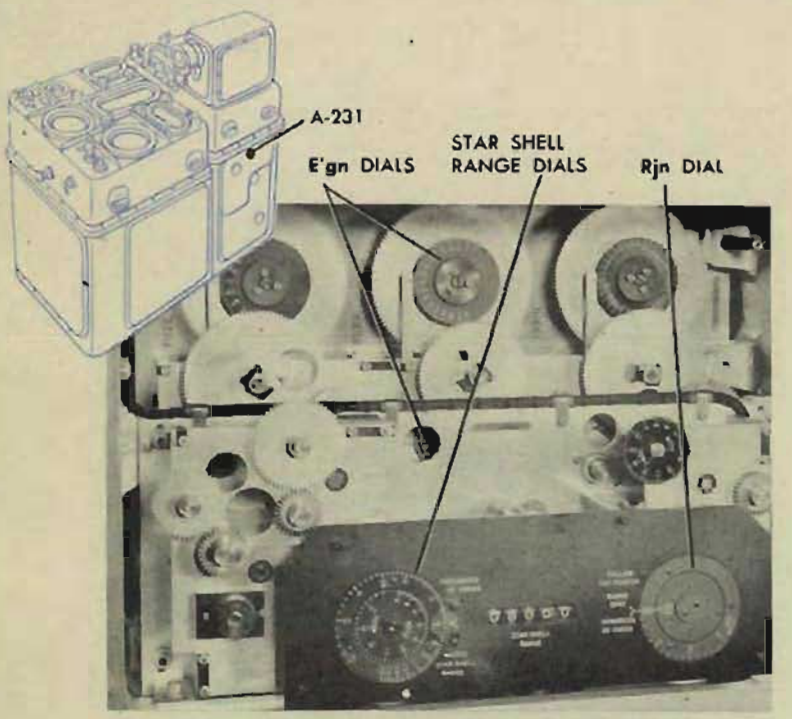
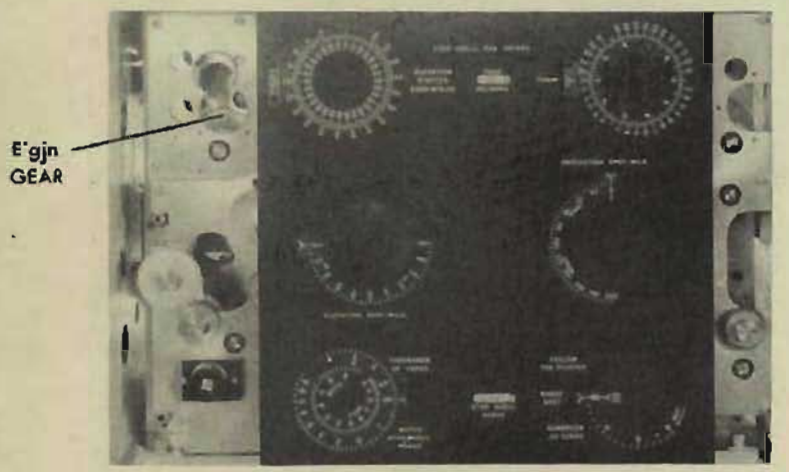
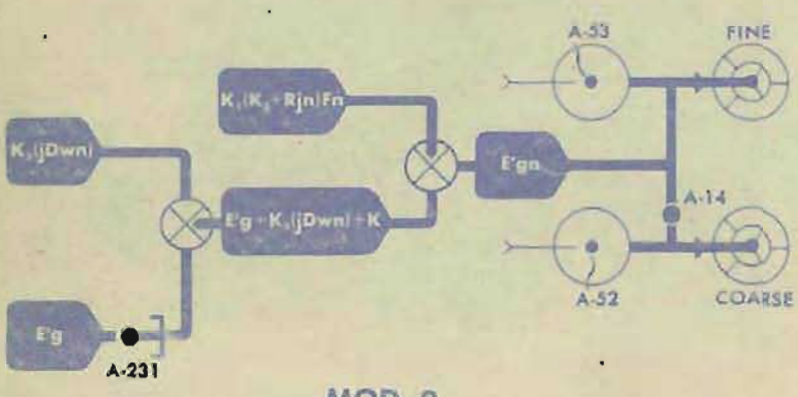
A-231 E'gn DIALS to E'g DIALS







MOD 0

Location

A-231 is located under cover 6 in Computer Mark 1.

Check

For mechanical fuze, Mods 0 and 1:
Set both the star shell range ring dial and the fuze range dial at 8,000 yards.
On Mod 1 set *E'jn* at 0.
Set *Rjn* at 0.
The *E'gn* dials (*E'gjn* dials on Mod 1) should read 373′ more than the *E'g* dials.

On Mod 1, check A-22 before readjusting A-231.

For powder fuze, Mod 0:
With the same settings as above, the *E'gn* dials should read 383′ more than the *E'g* dials.

For mechanical fuze, Mod 2:
Set both the star shell range ring dial and the fuze range dial at 10,000 yards.
Set *E'jn* at 0.
Set *Rjn* at 0.
The *E'gjn* dials should read 339′ more than the *E'g* dials.

Check A-22 before readjusting A-231.

Adjustment

If the *E'gn* (or *E'gjn*) dials do not read the correct amount more than the *E'g* dials, loosen A-231.

For Mod 0:
Hold the *E'g* line. Turn the *E'gn* gearing until the correct *E'gn* reading is obtained.

For Mods 1 and 2:
Hold the *E'g* and *E'jn* lines. Turn the *E'gjn* input gear until the correct *E'gjn* reading is obtained.

Tighten A-231 and recheck.

HANDCRANKS

The handcranks in the Star Shell Computer Mark 1 have adjustable friction relief drives and holding frictions. The fuze range and the range spot knobs have friction relief drives only. The elevation and the deflection handcranks, not on the Mod 0 instruments, have friction relief drives and holding frictions. Disassembly and repair of a typical handcrank is discussed in OP 1140A.

HOLDING FRICTION

Location

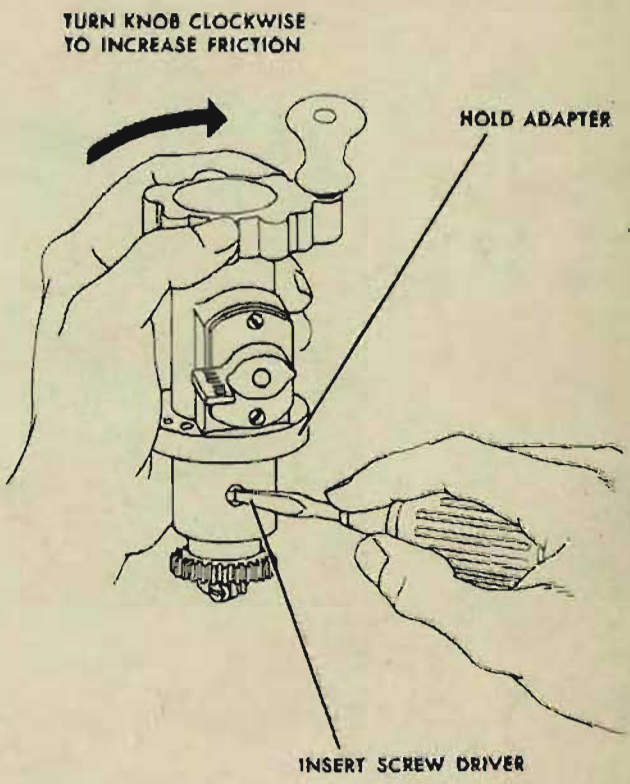
The holding friction is inside the handcrank.

Check

The holding friction should be tight enough to maintain the setting of its quantity under normal operating conditions, yet loose enough for easy operation.

Adjustment

Remove the handcrank from the cover and set it in the outer position. Turn the knob until the adjustment slot appears in the opening; then insert a small screw driver into the slot. Turn the knob clockwise to increase the friction or counterclockwise to decrease the friction.



FRICTION RELIEF DRIVE

Location

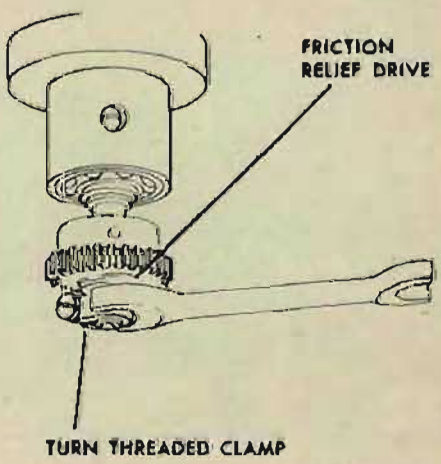
The friction relief drive is at the input gear on the end of the handcrank shaft.

Check

The friction relief drive should be tight enough to drive the line, but loose enough to slip without damaging the shaft line whenever a limit stop is reached.

Adjustment

Loosen the threaded adjustment clamp and turn it clockwise to increase the friction or counterclockwise to decrease the friction. Tighten the clamp.



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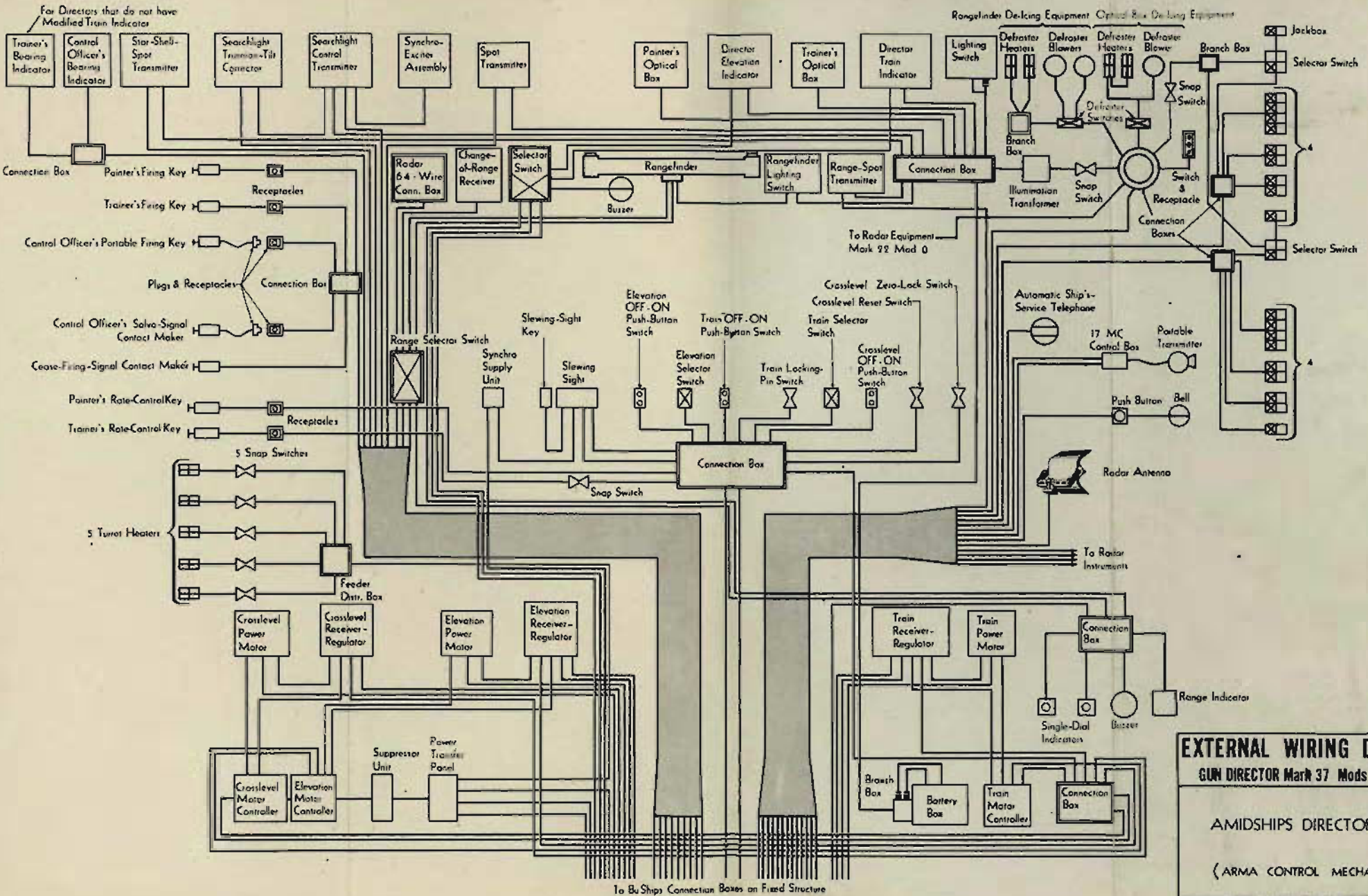

EXTERNAL WIRING DIAGRAM

GUN DIRECTOR Mark 37 Mods 9 and 87

AMIDSHIPS DIRECTOR (BB)

(ARMA CONTROL MECHANISM)

REFERENCE: ORDNANCE DWG. No. 244 117

Fig. 524