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Operating instructions for azimuth drift compensator installed at Osborne Head RDF in February, 1943 MacKinnon, K. A.

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PRA-74

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ANALYZED

NATIONAL RESEARCH COUNCIL OF CANADA
RADIO BRANCH

OPERATING INSTRUCTIONS FOR AZIMUTH
DRIFT COMPENSATOR INSTALLED
AT OSBORNE HEAD RDF
IN FEBRUARY, 1943

Declassified To

OPEN

OTTAWA

MARCH, 1943

OPERATING INSTRUCTIONS FOR AZIMUTH DRIFT
COMPENSATOR INSTALLED AT OSBORNE HEAD RDF
IN FEBRUARY 1943

As pointed out in PRA-20⁽¹⁾, page 5, the absolute azimuth indication is directly affected by the frequency of the transmitter and the tuning of the input stage of the receiver, although the relative azimuth indication, i.e. the angle between two fixed objects, is not so affected.

When the azimuth information was transmitted by telephone, the absolute azimuth error was eliminated before tracking commenced by balancing the array on a target of known azimuth and adjusting the azimuth selsyn pointers to read the correct value. However, with the installation of the displacement convertor at Osborne Head, this procedure is no longer valid.

The Azimuth Drift Compensator

The method adopted utilizes a Magslip Hunter Mark II inserted between the azimuth vernier transmitter selsyn in the tower and the receiving selsyns in the CD set and the displacement convertor. This device has a three phase stator and a three phase rotor. The relative angular position of the rotor and the stator is in normal use fixed, but may be adjusted with a worm gear arrangement. Turning the worm gear knob has the effect of rotating the receiving selsyn rotors although the transmitting selsyn rotor remains fixed.

A detailed assembly of the compensator is shown in the attached drawing No. NRC-RE-223-C. The adjusting knob is part No. 17. The dial, part No. 15, is uniformly divided in 100 divisions but this is quite arbitrary and has no significance. Stops on the mechanism limit the rotation between dial readings of 17 and 82 which corresponds to a total rotation of 3.2° as read on the receiving azimuth vernier dial.

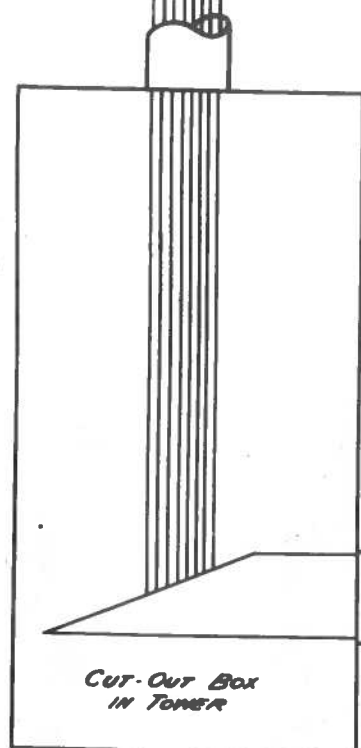
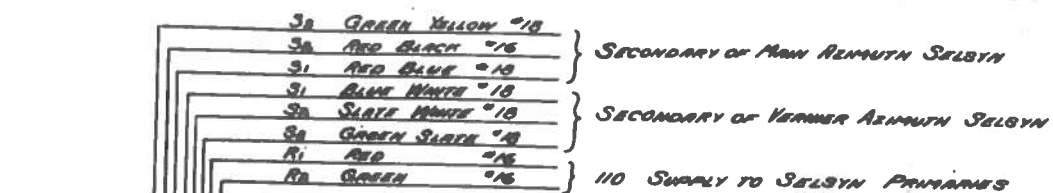
The changes in the wiring to take care of the compensator are shown in attached drawing No. NRC-RE-97, revised as of 23-2-43.

Operating Instructions

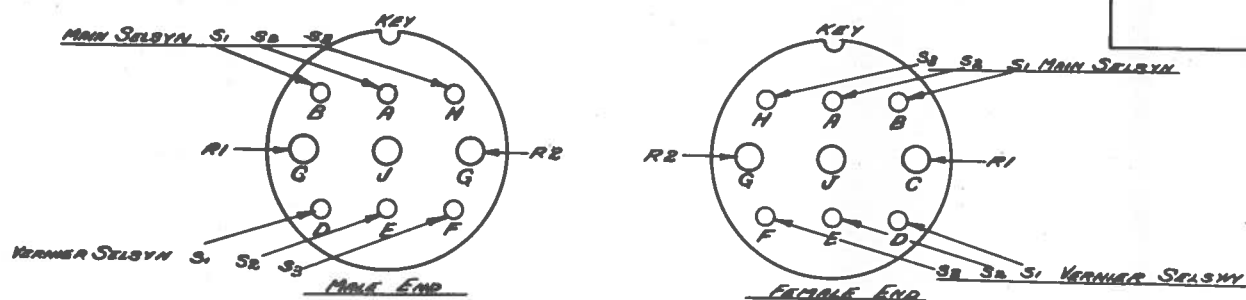
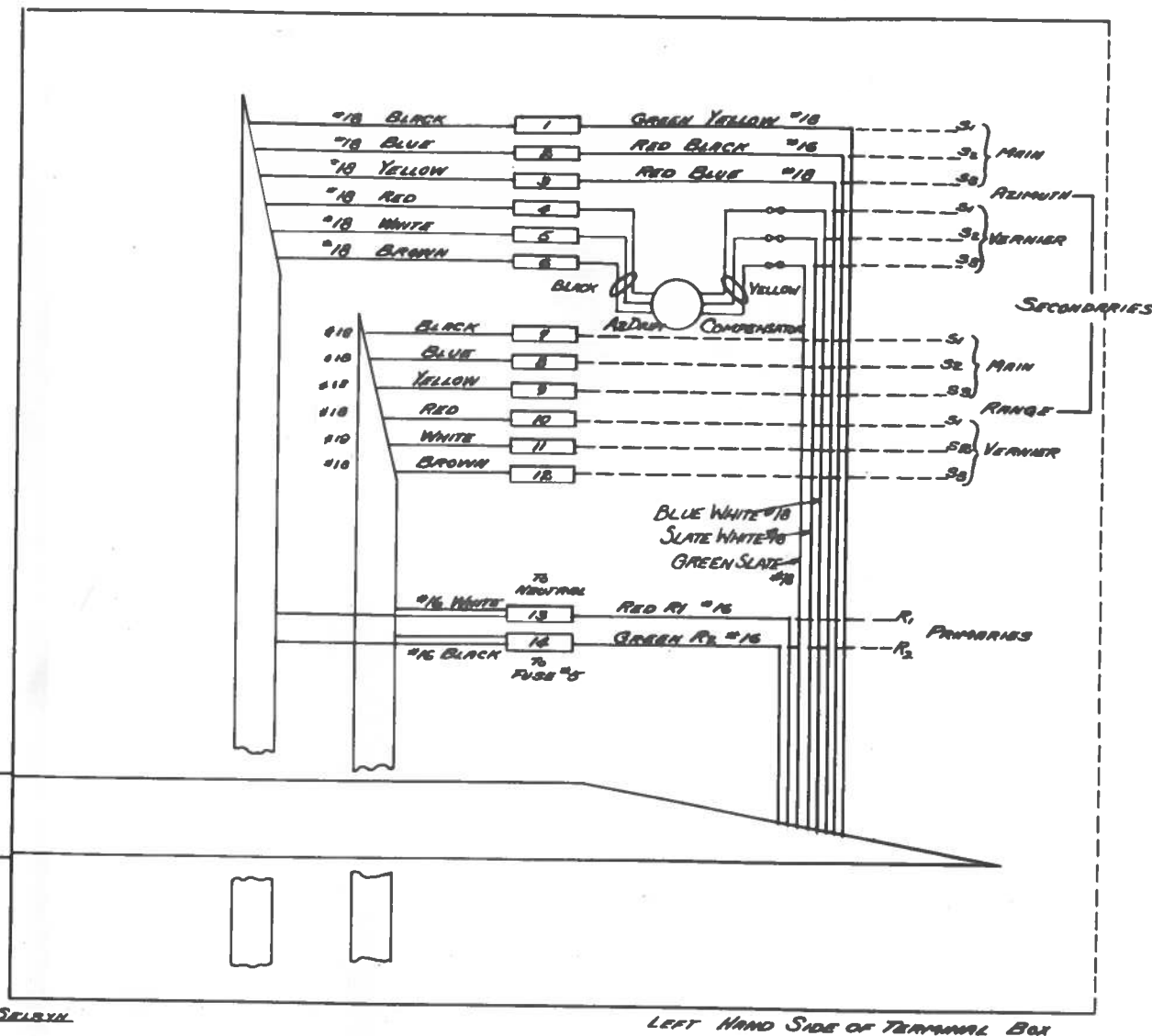
To remove the absolute azimuth error at any time, carefully balance the array in the usual manner on the Graham Head datum and then adjust the knob of the compensator until the CD set azimuth dials read exactly the known azimuth of the datum.

At no time should the pointers of the CD set azimuth selsyns be turned on their shafts.

(1) PRA-20 "Performance of the CD Installation at Duncan's Cove" (The antenna installation at Osborne Head is similar to that at Duncan's Cove.)



PART OF 24 CONDUCTOR LEAD COVERED CABLE



AMPHENOL - AN 310B-28-10

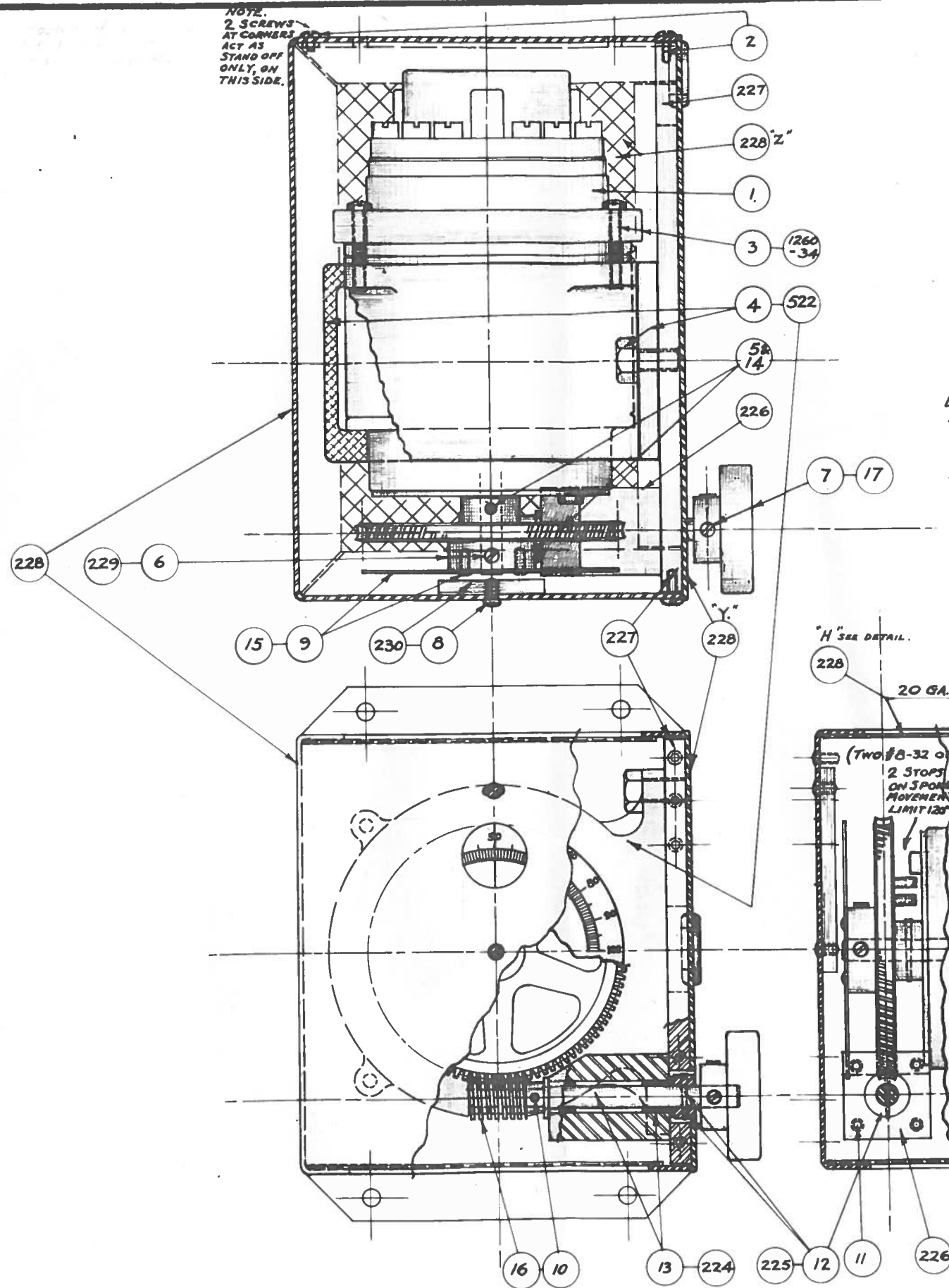
AMPHENOL - AN 310B-28-15

BACK VIEW OF PLUG & SOCKET
KEY POSITION #1

WIRE NO.	COLOR	24 CONDUCTOR LEAD COVERED CABLE	WIRE NO.	COLOR	8 WIRE CASTING SELSYN CABLES AND CONNECTORS
1	GREEN YELLOW S ₃	SECONDARY OF MAIN AZIMUTH SELSYN LEADS REVERSED AS SHOWN TO INSURE PROPER DIRECTION OF ROTATION.	1	WHITE R ₁	ALL SELSYNS TO BE CONNECTED AS SHOWN UNLESS OTHERWISE STATED
2	RED BLACK S ₂		2	BLACK R ₂	
3	RED BLUE S ₁		3	BLACK S ₁	
4	BLUE WHITE S ₁	SECONDARY OF VERNIER AZIMUTH SELSYN	4	BLUE S ₂	110V. SUPPLY SELSYN PRIMARIES
5	SLATE WHITE S ₂		5	BLUE S ₃	
6	GREEN SLATE S ₃		6	YELLOW S ₃	
7	RED R ₁	110 V. SUPPLY TO SELSYN PRIMARIES	7	RED S ₁	MAIN SELSYN SECONDARY
8	GREEN R ₂		8	WHITE S ₂	
9			9	BROWN S ₃	
10			10		VERNIER SELSYN SECONDARY
11			11		
12			12		

REVISED: 23-2-43.
REVISED 24-4-42

ITEM	PART NO.	QTY.	DATE	DESCRIPTION
DRAWN BY	W.H. JONES - 242		DATE	JUNE 29-42
CHECKED			DATE	
ENG. APPROV.	R.S.R.		DATE	
NATIONAL RESEARCH COUNCIL-RADIO SECTION - OTTAWA CANADA				
NAME C.D. AT OSBORNE HEAD				DWG. NO. NRC-RE-97
SELSYN CONNECTORS				



DRG. NO.	PART NO.	QUAN.	MATERIAL	DESCRIPTION.
ITEM 1	STOCK	1	-	3" MAGSLIP HUNTER MK. II
2	14	STEEL	ROUND HD. MACH. SCREWS $\frac{3}{8}$ " LONG #8-32	
3	4	FIL.	HEX	
4	2	HEX		
5	1	TAPER PIN #00000	$\frac{1}{16}$ " LONG.	
6	2	GRUB SCREWS $\frac{3}{16}$ "		
7	2			
8	2	FIL. HD. MACH. SCREWS $\frac{1}{16}$ " #6-32		
9	3	FLAT HD.	$\frac{1}{4}$ " LONG #4-40	
10	1	TAPER PIN #00000	$\frac{3}{8}$ " LONG.	
11	4	FLAT HD. MACH. SCREWS $\frac{1}{16}$ " #6-32		
12	1	TAPER PIN #00000	$\frac{1}{2}$ " LONG	
13	2	OILITES #FT300 $\frac{1}{2}$ " I.D. $\frac{3}{8}$ " O.D. FLANGED.		
14	1	BRASS BOSTON WORM GEAR #G1031	3"	
15	1	DIAL		
16	1	STEEL BOSTON WORM HLTH	32 P.	
17	1	BAKELITE RADIO KNOB FOR $\frac{1}{2}$ " SHAFT		
18	1	RUBBER GROMMET $\frac{1}{2}$ " I.D.		
DRG. NRC-RE-1260-34 ONE BAKELITE 3" MAGSLIP CLAMP				
R.B. EX. - 522 ONE ALUMINUM HOUSING.				
NRC-RE	224-A	1	STEEL $\frac{1}{2}$ " DIA. WORM SHAFT.	
	225-A	1	COLLAR FOR $\frac{1}{2}$ " O.D.	
	226-A	1	PEDESTAL	
	227-A	1	BASE PLATE	
	228-C	1	16 GA. BOX, FLAT LAYOUT.	
	229-A	1	COLLAR AT DIAL 1" O.D.	
	230-A	1	CELLULOID, FOR HAIRLINE INDICATOR.	

ITEM	PART NO.	QUAN.	MATL.	DESCRIPTION
DRAWN BY H.F.L. WILSON DATE 5 JAN 43 SUPERSEDES				
CHECKED			DATE	SCALE FULL SIZE.
ENG. APPROV. RWA			DATE 8 JAN 43	FINISH
NATIONAL RESEARCH COUNCIL-RADIO SECTION - OTTAWA CANADA				
NAME ANTENNA BEARING DRIFT COMPENSATOR				DWG. NO. 223-C
				NRC-RE