# WESTON ELECTRICAL INSTRUMENTS FOR AIRCRAFT

Weston Aircraft Instruments are supplied to the Air Ministry and to leading military and civil aircraft manufacturers throughout the world.

Sangamo Weston Ltd. are Design Approved by the Ministry of Supply, and the engineers at our Works and at our Branches are always available to discuss any problems or to give any assistance which may be required in connection with these instruments. Enquiries at any of our addresses will receive immediate attention.

### MODEL S114 I.L.S. INDICATOR

Information contained in this manual affecting safe operation and maintenance has been verified and approved by the Air Registration Board in accordance with Chapter A6-2 of British Civil Airworthiness Requirements. 29, 9, 54.

# SANGAMO WESTON LIMITED.

Head office and Works:

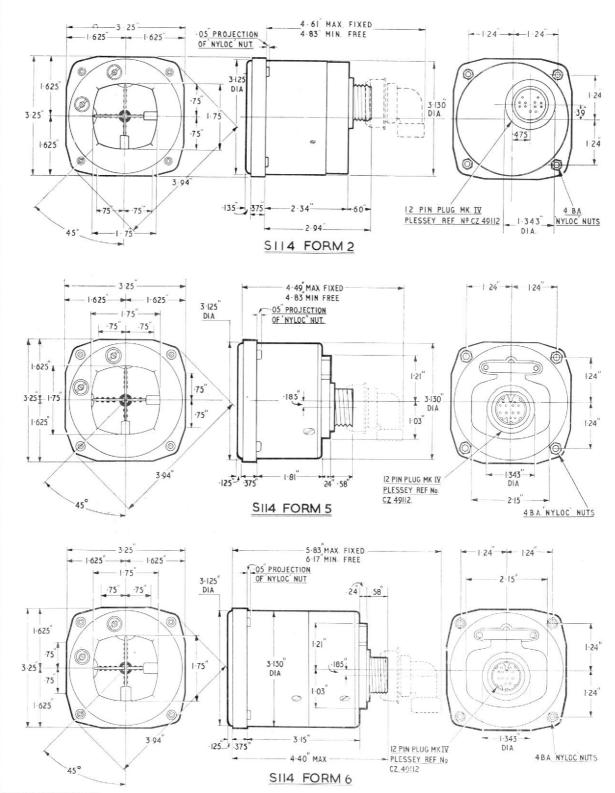
ENFIELD, MIDDLESEX, ENGLAND

Telegrams: "Sanwest, Enfield."

Telephones: Enfield 3434 (6 lines), Enfield 1242 (6 lines)







#### INTRODUCTION.

This model is used in conjunction with electrical and radio aids to indicate the departure of an aircraft from the azimuth and glide path tracks of an instrument landing system. It incorporates monitoring devices which show the condition of the indicators.

The instrument was designed in accordance with British Standard Specification G.128, and passes the relevant inspection clauses.



#### DESCRIPTION.

Four separate microammeters are contained in a large S.A.E. case. Two are used to indicate navigational position, whilst the other two operate the monitor flags.

The vertical pointer has its movement pivot centre at the top of the case, and denotes deviation from azimuth. The other pointer is horizontal with its movement pivot centre at the left when viewed from the front, and indicates departure from glide path. Both pointers extend over the full span of the scale when undeflected from the centre. The horizontal indicator is nearest to the scale.

The two other movements carry monitor flags. These show in a positive manner whether or not the indicator movements are working satisfactorily. When these movements are unoperated, the flags obscure the ends of the adjacent pointers, but, when operated, carry the monitor flags behind the front screen where they are no longer visible.

The complete instrument is contained in a cylindrical black bakelite case with a flange at the front so that when mounted, the cover glass is approximately flush with the panel.

Connection to the I.L.S. receiver is made through a Mark IV 12-way plug and socket. The plug is mounted directly on to a black bakelite base.

All movements are insulated from earth and from each other to withstand a potential of 250 volts D.C. Internal metal parts are insulated to withstand a potential of 1,000 volts A.C. applied between the movements and any external part, including a screwdriver held in either zero adjusting screw.

The pointers are set by weatherproof zero adjusters fitted to the cover. Care must be taken to slacken off the hollow screws before the inner adjusting screws are moved. After setting the pointers, the hollow screws must be locked in a clockwise direction on their washers.

The centre of the dial is marked with a circle  $\frac{1}{4}$  inch mean diameter,  $\frac{5}{64}$  inch thick. On a horizontal line passing through the centre, eight dots  $\frac{5}{64}$  inch diameter are marked, four on each side of the circle. Eight similar dots are marked on a vertical line. The distances of these dots from the centre of the  $\frac{1}{4}$  inch diameter circle are  $\frac{1}{4}$  inch,  $\frac{3}{8}$  inch,  $\frac{1}{9}$  inch and  $\frac{5}{8}$  inch.

These dial markings are in fluorescent paint on a matt black background.

#### INSTALLATION NOTES.

The instrument must be insulated from aircraft vibrations. Under certain circumstances it may be desirable to use an anti-vibration mounting of the type 10A/12954. Normally it should be fitted to the Instrument Flying Panel, where it will operate satisfactorily.

The indicator is fitted to the rear of the panel and is secured in position by four No. 4 BA. bolts. It must be mounted with its scale in a vertical plane when the aircraft is in level flight.

### TÁBLE OF CONNECTIONS.

Vertical Pointer Azimuth. Pins A and B.	Horizontal Pointer Glide Path. Pins C and D.	Monitor Flag Azimuth. Pins J and K.	Monitor Flag Glide Path. Pins L and M.
Deflection to Right.	Deflection Upwards.	Deflection to Right.	Deflection Upwards.
A + VE	C + VE	J + VE	L + VE

Pin G is connected to internal metal parts

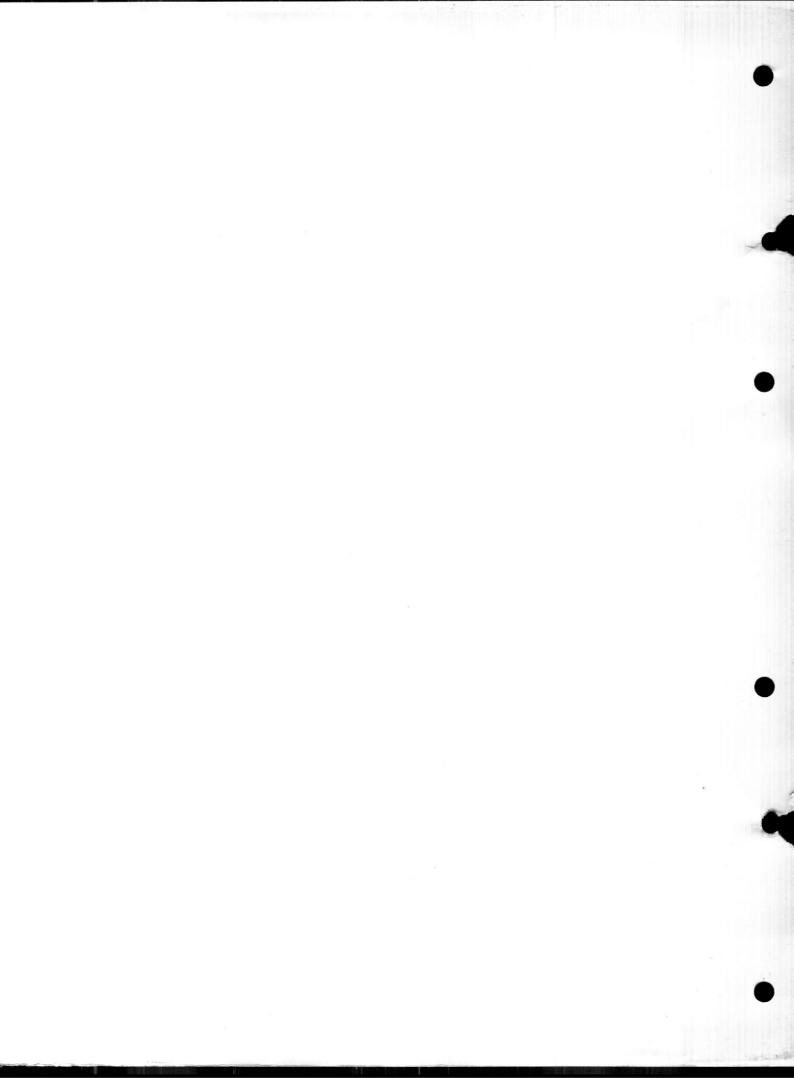


# **DECLARATION**

# INFORMATION REQUIRED BY BRITISH STANDARD G.100.

# MODEL S114, FORMS 5 AND 6.

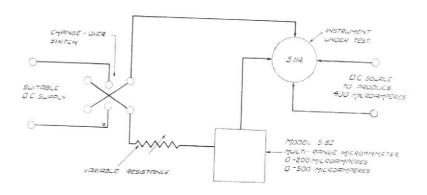
Weight .									1200	22½ ozs.
Maximum Sto	orage pe	eriod	without pro	eservatio	n packing	4.4				6 months.
Acceleration (	Grade	• •	510	2.5	*					1B
Climatic Grad	le and		*:*		202					1
Altitude Ratin	ıg		101		***		1.0			60,000 ft.
Vibration Gra	de	5 V	FT.				**	*.*	25.75	3 when mounted on instrument flight panel.
Fire Resistanc	e Grad	e			.;		34.4		04000	Fire Resistant.
Compass Safe	Distan	ice	13							12 inches.
C.G. Position		• •	0	• •	***		**	**		$1\frac{1}{2}$ in, from glass along geometric centre.





# METHOD OF TESTING.

The instrument is tested most conveniently by removing it from the aircraft and operating it in the simple test circuit, as shown.



The resultant performance should meet the following requirements.

# INDICATOR MOVEMENTS.

#### Sensitivity:

The current required to deflect the indicator pointer from its centre zero to either end of the scale as shown by the white dots at the extreme positions from the centre, should be  $150 \pm 10$  microamperes.

#### Scale Characteristics:

The relationship between the current in the movement and the angular deflection of the indicator pointer is such that increments of current must cause equal increments of deflection.

#### Damping:

Indicator pointers must not deflect beyond their steady state value when operating in a circuit of infinite impedance.

#### Resistance

The resistance of the movements measured between the base connections must be 1,000 ohms  $\pm 30$  ohms.

#### Attenuation:

The indicator should be supplied with a sinusoidal varying current of 2, 4 and 6 cycles per second having a peak amplitude of 150 microamperes. Under these conditions the maximum deflection of the indicator from zero must not exceed 20, 10 and 3 per cent. respectively of the value it would have attained if it had been supplied with 150 microamperes D.C.

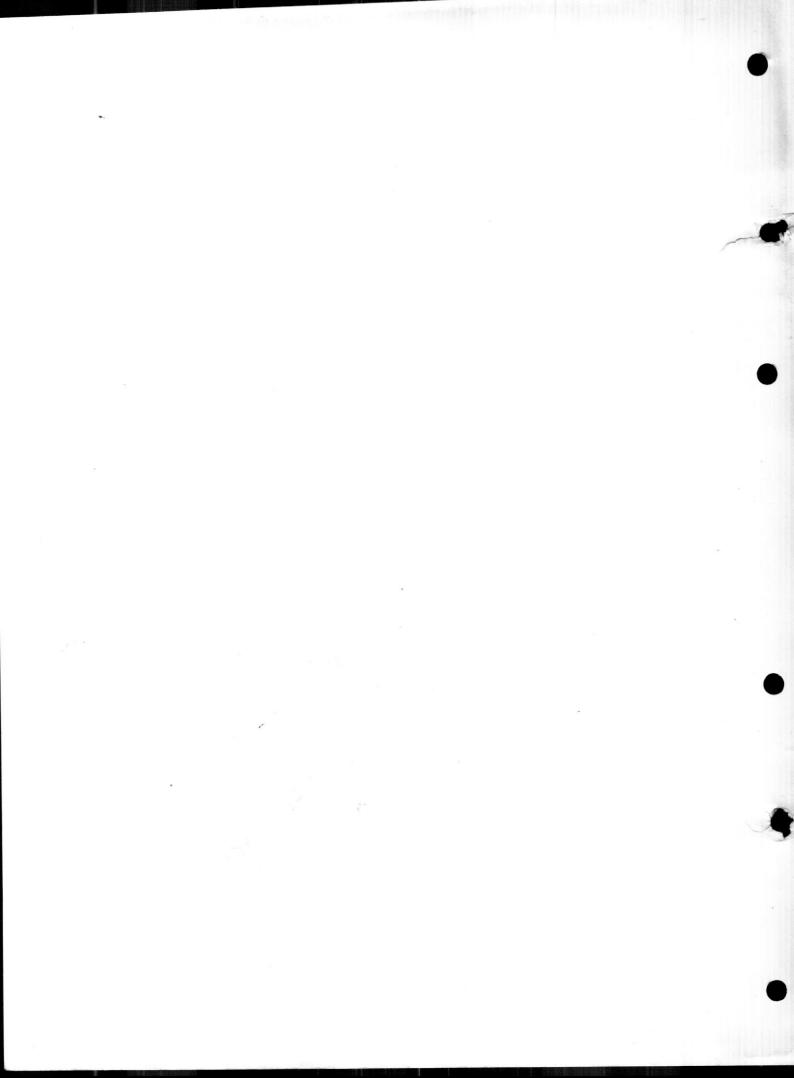
### MONITOR FLAG MOVEMENTS.

#### Sensitivity:

The monitor flags should remain in their unoperated position until an operating current in excess of +15-10 microamperes is applied. Thereafter, a current of 415+10-15 microamperes should be sufficient to move the monitor flags out of sight behind the mask.

#### Resistance:

The resistance of the movement measured between the base terminals should be 400 ohms  $\pm 20$  ohms.





#### MAINTENANCE AND REPAIR.

If a fault is obviously electrical, the first step is to check the connections to the movement. An electrical check of the movement itself will be necessary if no fault is revealed by the initial investigation.

Make sure that the moving coil is definitely the part affected and that the fault is not caused by a defective

spool or damaged return springs. If these appear intact, make a resistance test across the coils.

To do this, remove the cover and unsolder the coloured lead connected to the top bridge of the suspected movement. A resistance measurement taken between the top and bottom bridges should give between 84 and 100 ohms for the indicator movements, and between 300 and 400 ohms for the monitor movements.

The following procedure should be adopted where it is necessary to replace an open circuit moving coil. Refer to the exploded illustration and read carefully through the following instructions before starting operations.

Strip down to the movement complete. Slacken the magnet clamps on either side of the affected movement, and take out the magnet. Upon removal of the screws, the movement will become loose, and may be withdrawn with a slight turning action.

Disconnect the top spring and the bottom spring. Take off top and bottom bridges. Remove cross-arm, carefully noting the original position of springs and cross-arm for re-assembly purposes. Slacken off and take out screw, and remove core clamp. The core may now be removed. When performing this last operation, care must be taken not to damage the spring.

Place the new coil over the core, and gently lower into place. Looking along the pointer from the movement, the soldered joint must be on the right-hand side. Re-assemble in a sequence of operations in a reverse order to those already quoted, but before replacing the bridges make sure that the springs are in their original angular

position relative to the coil. When this has been verified, the bridges may be refitted.

Carry out jewel adjustment by turning the jewel screw clockwise in small increments in the order of 1/10th turn until pointer "flop" just disappears. ("Flop" is the movement of the pointer due to the pivots being able to move laterally in the jewels). Back off the jewel screw by an amount 1/10th to 1/8th turn until a definite pointer "flop" is apparent.

The outer ends of the springs should now be soldered into position on the bridges.

It should be stressed that if one spring is damaged, both springs on the movement must be replaced so that the dorrect torque is maintained.

#### RAISING THE MAGNETS.

Replace the movements on to the mounting plate, and slacken off *all* pole piece screws and magnet clamps. The single turn raising bar is positioned through the diametric centre of the magnet system, and a current of approximately 10,000 amperes passed through it to saturate the magnets.

After this operation, the assembly will be found held together by magnetic attraction, and should be clamped

in this position.

#### AGEING THE MAGNETS.

In their present state the magnets are in a saturated condition, and the gap fluxes must be reduced to give

the magnetic circuit its required stability.

A single conductor is inserted through the diametric centre of the magnet system, and a current of 150 amperes 50 cycles A.C. passed through it. This current must be raised to its maximum and reduced to zero over a period of not less than 5 seconds, once only.

#### \$ENSITIVITY AND MAGNETIC POLARITY CHECKS.

Each movement must be checked for sensitivity and polarity and should meet the conditions specified below.

#### Indicators

Sensitivity (saturated, aged, and with shields in position) should be between 82—100 microamperes.

#### Monitors:

With a current of 128 microamperes passing through the monitor movement, adjust the abutment until the flag is in the unoperated position. The current now required to just deflect the monitor behind the mask should be between 247—303 microamperes.

If the movements are less sensitive than the figures quoted, the raising procedure should be investigated and repeated.

#### Polarities:

During the sensitivity check, the following polarities should be observed:

Vertical Indicator with Top Bridge Positive deflects to the right.

Horizontal Indicator with Top Bridge Positive deflects upwards.

Vertical Monitor with Top Bridge Negative deflects clockwise

Horizontal Monitor with Top Bridge Negative deflects clockwise.



#### BALANCING THE MOVEMENTS.

For the purpose of these checks, the instrument should be set alternately vertical and horizontal.

#### Indicators :

When balancing the indicator movements, the tail and side arm balance is to be such that the pointer does not move over half the width of the extreme dot on the scale.

#### Monitors:

Free the monitors from their stops by passing a current of approximately 200 microamperes through both movements connected in series. Adjust the abutments to give approximately half-scale deflection. The balance of the monitor flags must be as good as possible. The corner of the flag can be adjusted (by the current in the coil) to coincide with the edge of the mask when checking the out of balance movement. Set the pointer stop on the monitor to give the suppressed (zero) position with the monitor flag centrally disposed over the indicator pointer with the latter at centre zero.

#### ADJUSTMENTS.

Mount the shielded cover, which incidentally, must be in place before adjustments are made, place the instrument with its scale in the vertical plane, then adjust in accordance with the following instructions.

#### Indicators

Shunt the moving coil of one movement by means of a resistance box to a sensitivity of  $150\pm3$  microamperes. Note the value of the shunt, which should be between 100 and 160 ohms. Using a low volt ohmmeter, measure the resistance required in series with the shunted movement to bring the total resistance up to  $1{,}000\pm20$  ohms. This series resistance should be between 940—955 ohms.

This check must be repeated for the other indicator movement.

#### Monitors

Each monitor movement should be adjusted in the manner described below.

Pass a current through the moving coil until the flag just disappears behind the mask. Note the current required, and designate it as (a). Now pass a current through the moving coil so that the flag just moves away from the zero position. This is current (b). The ratio (a)/(b) must be approximately 2.24.

If the ratio is greater, the spring abutment must be moved by a small amount in an anti-clockwise direction.

The abutment, of course, must be moved in a clockwise direction if the ratio is too small.

Now shunt the moving coil through a resistance box so that the flag just disappears behind the mask for a current of  $415 \pm 5$  microamperes. Reduce the current and note its value when the flag just moves away from the zero position. This should be  $185 \pm 5$  microamperes. Note the value of the shunt, which should lie between 400-1,200 ohms.

Measure the value of the resistance required in series with the shunted movement to make the total resistance

up to 400  $\pm$ 15 ohms. This series resistance should be 130–210 ohms.

Fit spools to determined values, and note that all shunt spools are copper wound, and all series spools are constantan wound.

#### FINAL CHECKS.

(a) Re-check sensitivities to previously stated limits.

- (b) Check response time of indicators. Set indicators to full-scale deflection. Switch off circuit, and with a suitable stopwatch, measure the time taken for the pointers to reach to within 1 per cent. of zero. This should lie between 1·2—2·4 seconds.
- (c) Apply 250 volts D.C. between pin G and each of the pins A, C, J, L in succession. Use a 5-megohm resistor in series with the supply. The current flowing in the circuit must not exceed 2 microamperes.

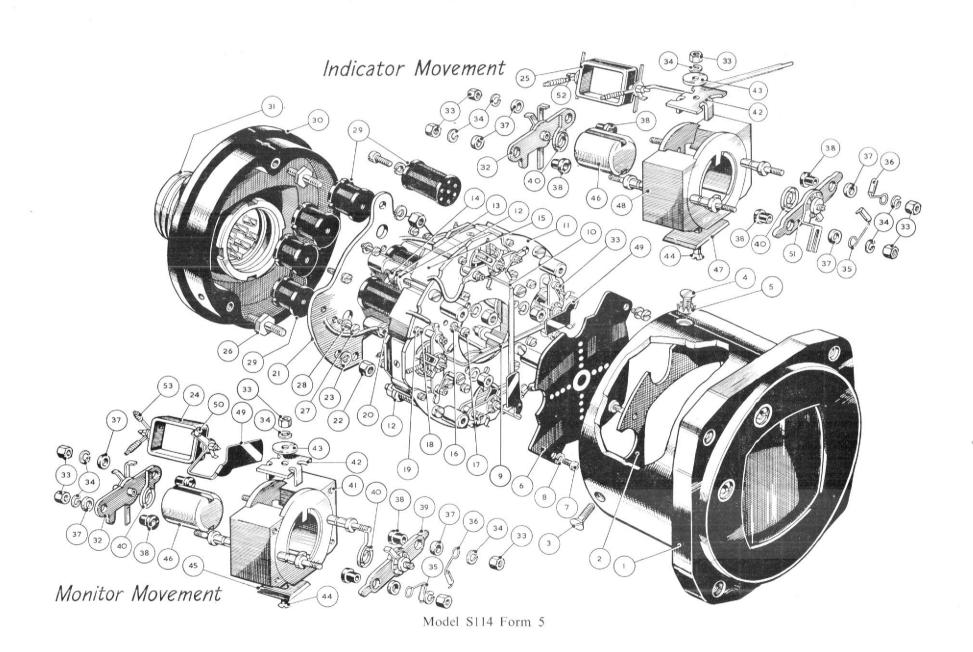
#### INSPECTION.

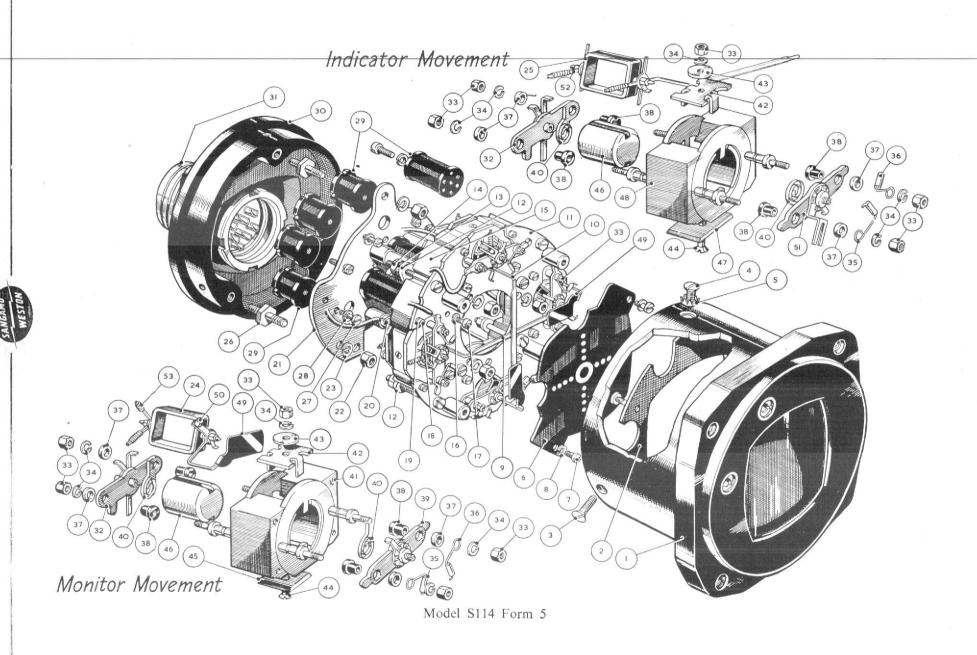
Subsequent to satisfactory installation, the instrument should be checked visually to ensure that the glass is unbroken and that the terminal screws, or plugs and sockets are tightly connected. No other maintenance is necessary for a period of 1,000 flying hours. On the completion of this period, the instrument should be checked for accuracy, preferably in situ, as apparatus of this nature is more liable to damage from handling than from years of service. If the instrument is within permissible limits, it should be passed as serviceable for a further 1,000 hours service.



# PARTS LIST MODEL SII4, FORM 5.

Reference		Des	scriptio	on					Part No.	No. Of
1	Cover Assem				15.50	202			166955	1
2								2.2	164676	1
3	Screw 6BA		14.45						150146	2
4	Sealing Screw 6BA								168862	1
5									168013	1
6	D: 1								164718	1
									1,0000	
7	Screw 10BA. $\times \frac{3}{16}$ (Sc ale)		14.40						156396	2 2
8				• •	* *	• •	• •		159306 164705	1
	Tomter Assem. (E.II.)	102	* *						101703	
10	Pointer Assem. (Upper)			979					164704	1
11			9.0						164681	I
12	Magnet Clamp	* *		* *					164713	4
13	Lock Washer 8BA			2026	90000	200			193858	8
14	3.1 0.0 1								150164	8
15				***					154712	4
	1 1 10 1 2881								152347	17
16									153367 155546	8
17 18	Screw 10BA. Ch. Hd. $\times \frac{1}{8}$ Screw 12BA. Ch. Hd. $\times \frac{1}{8}$								150122	8
10	Sciew 12bA, Cil. Hd. X §								100122	U
19	Lock Washer 12BA								155830	8
20	Terminal Tag 8BA						5/5		164637	1
21	Sub-Mtg. Plate Ass								166958	1
22	Nut 6BA		-						150166	3
23									156976	3
24	Moving Coil Wd. (Monitor								Specify Code	2
				100/12/2						
25	Moving Coil Wd. (Indicato								Specify Code	2
26 27	Mtg. Plate Pillar Screw 10BA. $\times \frac{3}{16}$ (Spool)							14.40	166965 150330	3 8
<i>41</i>	Serew TOBA. A T6 (Spoot)	<u></u>			• •	**			150550	0
28	Lock Washer 10BA. (Spool	)							153367	8
29	Spools							14.40	Specify Letter	9
20	B B 31 1		¥.						No.	
30	Base Drilled				1111		11.1	2.5	166926	1
31	Plug 12 Pin								164717	1
32	D I I D								164694	4
33	Nut 12BA								155125	20
2.4	Lasta Washer 12D4								155020	20
34 35		• •	• •	* *			*	35.5	155830 164711	20 4
36	B								164710	4
							V			
37					10.5	2.5			154399	16
38				• •					154397	16
39	Bridge Ass. Top (Flag)	• •	• •	• •		11.77			164696	2
40	Spring. Specify Code A						-72		156895	8
41	Pole Piece Ass. (Flag)								168480	2 4
42	C CI								157521	4
12	Wester 12D L. T.								150504	
43 44					• •		400	9-8	159596 155584	4 4
45	C DI (FI						63	2.6	164715	2
		200		6.00	10527	10.55	#16# 	100 To		
46							¥004	0.40	155580	4
47				* *			• •	* *	164714 168481	2 2
48	Pole Piece Assem. (Pointer)		• •	***			5.0	2.0	100401	
	Flag Assem								164698	
49	TI OMI								167110 > Sp	ecify 2
	Flag Off R.H								167111	800 800
50						• •	0.505		157241	2
51	Bridge Assem. Top (Upper) Bridge Assem. Top (L.H.)				• •	• •			164692 \ 164690 \	1
	(Bridge Assem. 10p (L.H.)		5.7						104070 )	











# PARTS LIST MODEL SI14, FORM 5.

Reference		D	escripti	ion					Part No.	No. Of
1 2	Cover Assem Mask for Cover								166955 164676	1 1
2 3	Screw 6BA				***		63 63		150146	2
4	Sealing Screw 6BA								168862	1
5	Sealing Cup								168013	1
6	Dial								164718	1
7	Screw 10BA. $\times \frac{3}{16}$ (Sc a	le)							156396	2
8 9	Lock Washer 10BA Pointer Assem. (L.H.)								159306 164705	2
		• • •	••	•••	• • •					
10	Pointer Assem. (Upper) Mounting Plate Ass		40	94.40	***		***		164704 164681	1
12	Magnet Clamp								164713	4
13	Lock Washer 8BA								103858	8
14	Nut 8BA								150164	8
15	Magnet		*22						164712	4
16	Lock Washer 10BA								153367	8
17	Screw 10BA, Ch. Hd. ×	1" 8							155546	8
18	Screw 12BA. Ch. Hd. ×	8	• •	• •					150122	8
19	Lock Washer 12BA		***						155830	8
20	Terminal Tag 8BA Sub-Mtg. Plate Ass								164637 166958	1
			- 11							
22 23	Nut 6BA Lock Washer 6BA								150166 156976	3 3
24	Moving Coil Wd. (Mon		v.)						Specify Code	2
25	Moving Coil Wd. (Indic	ator Mo	ov.)						Specify Code	2
26	Mtg. Plate Pillar								166965	3
27	Screw 10BA. $\times \frac{3}{16}$ " (Sp	ool)							150330	8
28	Lock Washer 10BA. (Sp	oool)						1.1	153367	8
29	Spools				• •				Specify Letter No.	9
30	Base Drilled							5.5	166926	1
31	Plug 12 Pin			16. ·					164717	1
32	Bridge Ass. Bott								164694	4
33	Nut 12BA				• •		**		155125	20
34	Lock Washer 12BA								155830	20
35 36	Pointer Stop (L.H.) Pointer Stop (R.H.)								164711 164710	4 4
37	Bridge Insul. Washer Bridge Insul. Bush						• •		154399 154397	16 16
39	Bridge Ass. Top (Flag)								164696	2
40	Spring: Specify Flag or	Pointe	r Movi	t. and I	nst. Co	de No.			1-1	8
41	Pole Piece Ass. (Flag)								168480	2
42	Core Clamp								157521	4
43	Washer 12BA. Large								159596	4
44	Core Screw 12BA								155584 164715	4 2
									***************************************	
46 47	Core .4								155580 164714	4 2
48	Pole Piece Assem. (Poin								168481	2
-	Flag Assem								164698	
49	₹ Flag Off Lower								167110 > Sp	ecify 2
50	Flag Off R.H Counter Weight								167111 J 157241	2
51	∫ Bridge Assem. Top (Up	per)							164692	1
	Bridge Assem. Top (L.F								164690 ∫	
52	Bott. Balance Cross (Po	inter)							164709	2 2
53	Bott. Balance Cross (Fla								164701	2





# PARTS LIST MODEL SII4, FORM 2.

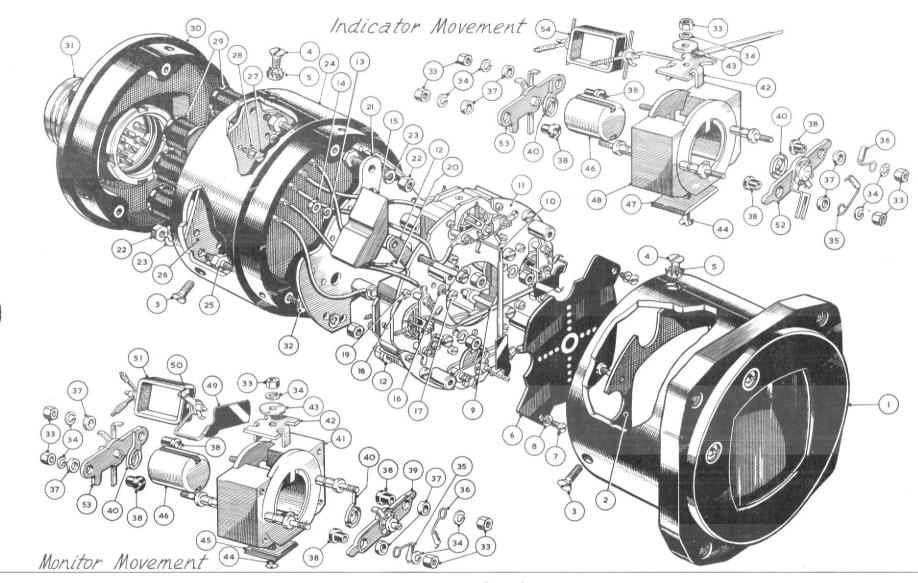
Reference		D	escripti	on					Part No.	No. Of
1	Cover Assem		2.6	***					164673	1
2	Mask						1.0	2.5	164676	1
3	Screw 6BA. $\times \frac{5}{16}''$ (Cover)								155128	2
4	Sealing Screw								166783	1
5	Glass								164677	i
6	Dial								164718	1
7	Screw 10BA. × 3 " (Dial)				-				156396	2
8	Lockwasher 10BA								159306	2
9	Pointer Assem. (L.H.)								164705	1
10	Deinter Asses (History)								17.470.4	
10 11	Pointer Assem. (Upper) Mounting Plate Ass.								164704 164681	1
12	Magnet Clamp								164713	4
1.2	I = -1- W/1 OD A								102051	
13 14	Lock Washer 8BA Nut 8BA						• •		103854 150168	8
15	Magnet								164712	4
									271/475/00-1997	
16 17	Lock Washer 10BA							* *	153367	8
18	Screw 10BA. $\times \frac{1}{8}$ Ch. Ho Nut 4 BA								155546 150164	8
		••					- 15	8.5	130104	
19	Lock Washer 4BA	***							150404	3
20 21	Washer 4BA			2.5			1.1	2.5	90031 164751	3 3
21	moun moner				• • •		• •	• •	104/31	
22	Insul. Bush								164716	3
23 24	Sub. Mtg. Plate							2. 6	164687	1
Z4	Moving Coil Wd. (Monito	or Mio	)V.)	•••			100		Specify Code	2
25	Moving Coil Wd. (Indicat	or M	ov.)						Specify Code	2
26									153496	8
27	Spools Wd			• •			*3	19. 61	Specify Code Letter	8
20	D. v.								124271	
28 29	Base								164671 164717	1
30	Screw 8BA. × 13 " Ch. Ho	1.							155373	8
31	Nive CDA								150177	
32	Nut 6BA Bridge Assem. Bott	• •							150166 164694	3 4
33	Nut 12BA								155125	20
24	Last Washes 12DA				11 12 12 17				155020	20
34 35	Lock Washer 12BA Pointer Stop (L.H.)	• •		• •		* *			155830 164711	20 4
36	Pointer Stop (R.H.)				• •				164710	4
27	_	-							4.848.00	1.2
37 38	Bridge Insul. Washer Bridge Insul. Bush				6.3	* *	• •		154399 154397	16 16
39	Bridge Ass. Top (Flag)								164696	2
						D 10	N65	W 80		
40 41	Spring. Specify Code A Pole Piece Ass. (Flag)	* *	• •					14. 40	156895	8 2
41	Core Clamp								168480 157521	4
******			10.5			• • •				
43	Washer 12BA, Large							9.0	159596	4
44 45	Core Screw 12BA		• •	* *	* *	**	606	1.1	155584 164715	4 2
1-0	core i mie (i mg)			502	**		• •		107/13	
46	Core .4		4.0						155580	4
47 48	Core Plate (Pointer) Pole Piece (Pointer)		* 6	200			• •		164714 168481	2 2
10	rote ricce (Folliter)	6.2		• •	••			••	100701	
10	Flag Assem								164698	
49	⟨ Flag Assem. off Lower   Flag Assem. off R.H.								167110 } Sp 167111	ecify 2
50	Lock Washer 6BA			 					156978	3
51	Terminal Tag 8BA								164637	1
52	∫ Bridge Assem. (Upper)								1646027	2
34	Bridge Assem. (Upper) Bridge Assem. (L.H.)			***					164692 \ 164690 \	2
53	Balance Cross (Pointer)								164709	2 2
54									164701	



# PARTS LIST MODEL SII4, FORM 2.

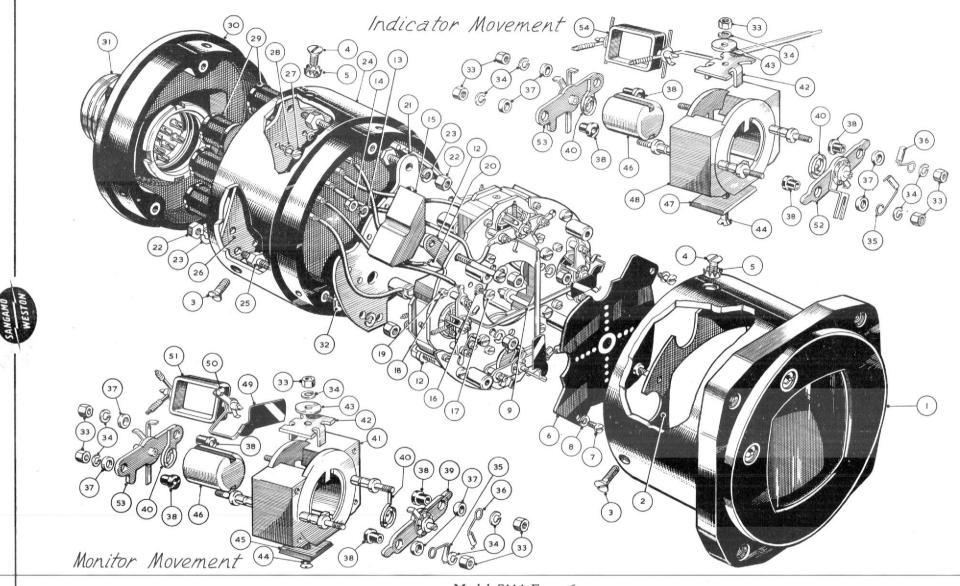
Reference		De	escripti	on					Part No.	No. Off
1	Cover Assem								164673	1
2	Mask								164676	1
3 *	Screw 6BA. $\times \frac{5}{16}''$ (Cover)	)			404	* *		2.0	155128	2
4	Sealing Screw								166783	1
5	Glass								164677	Î
6	Dial		5.2		4.2			2.5	164718	1
7	Screw 10BA. × 3/1 (Dial)								156396	2
8	Lockwasher 10BA								159306	2
9	Pointer Assem. (L.H.)				***		***	4.4	164705	1
10	Deinter Acces (Haman)								164704	1
10 11	Pointer Assem. (Upper) Mounting Plate Ass.								164/681	1
12	Magnet Clamp							4.6	164713	4
12	Y - 1- W1 OD A								102054	0
13 14	Lock Washer 8BA Nut 8BA		4.5		• •		* *		103854 150168	8
15	Magnet			• • •					164712	4
200000				8 F		8 47	1533 			
16	Lock Washer 10BA		*12			9.40	400	9.0	153367	8
17 18	Screw 10BA. $\times \frac{1}{8}$ Ch. Ho Nut 4 BA								155546 150164	8
10			133	• • •						
19	Lock Washer 4BA								150404	3
20 21	Washer 4BA Insul. Washer		*0*	(* *)	• •	3.6	* *		90031 164751	3 3
21	Insul. Washer		***			2.6			104/31	3
22	Insul. Bush								164716	3
23	Sub. Mtg. Plate	 			• •				164687	1
24	Moving Coil Wd. (Monito	or Mo.	v.)					* *	Specify Code	2
25	Moving Coil Wd. (Indicat	or Mo	ov.)						Specify Code	2
26	Stud 10BA. (Spools)								153496	8
27	Spools Wd	• •	* *		• •				Specify Code Letter	8
20	Daga								164671	1
28 29	Base 12 Pin Plug	• •							164717 155373	1
30	Screw 8BA. $\times \frac{13}{16}$ Ch. Ho	1.								8
21	Nut 6DA								150166	3
31 32	Nut 6BA Bridge Assem. Bott								164694	4
33	Nut 12BA								155125	20
2.4									155020	20
34 35	Lock Washer 12BA Pointer Stop (L.H.)	• •						6.5	155830 164711	20 4
36	Pointer Stop (R.H.)							100	164710	4
				1000	2000			2000	154200	1.0
37 38	Bridge Insul. Washer Bridge Insul. Bush							***	154399 154397	16 16
38	Bridge Ass. Top (Flag)								164696	2
40	Spring: Specify Flag or F							1.0	168480	8 2
41 42	Pole Piece Ass. (Flag) Core Clamp		10.00					100	157521	4
			4 1/	of all						
43	Washer 12BA. Large								159596	4
44 45	Core Screw 12BA	• •		• •					155584 164715	4 2
TJ		••		• •			**	**	104/13	
46	Core .4								155580	4
47 48	Core Plate (Pointer) Pole Piece (Pointer)								164714 168481	2 2
40	Tole Free (Fornter)	• •		• • •		• •		• •	100401	
	Flag Assem								164698	
49	Flag Assem. off Lower									ecify 2
50	Flag Assem. off R.H. Lock Washer 6BA		***						167111 J 156978	3
51	Terminal Tag 8BA								164637	1
									1646003	2
52	Sridge Assem. (Upper) Bridge Assem. (L.H.)					• •			164692 \ 164690 \	2
**	Balance Cross (Pointer)								164709	2
53										2





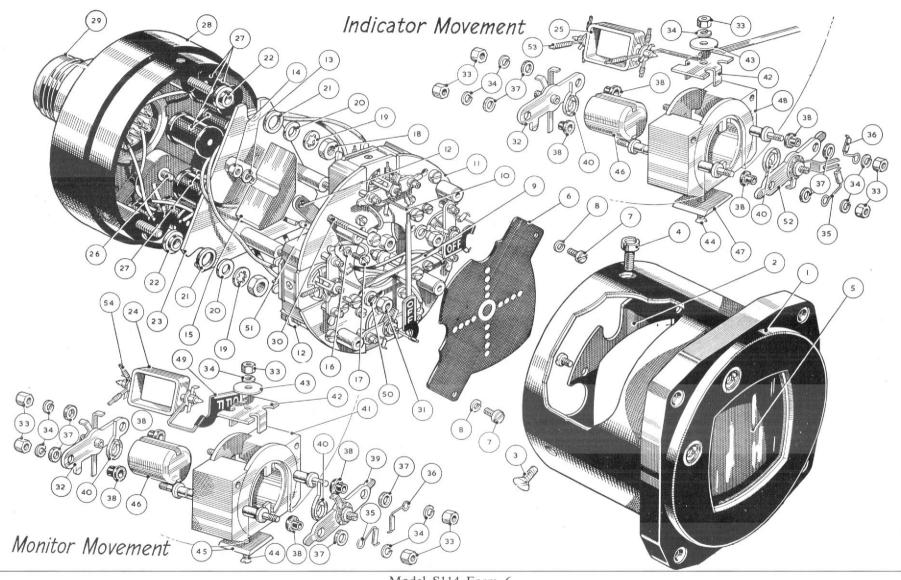
Model S114 Form 6





Model S114 Form 6





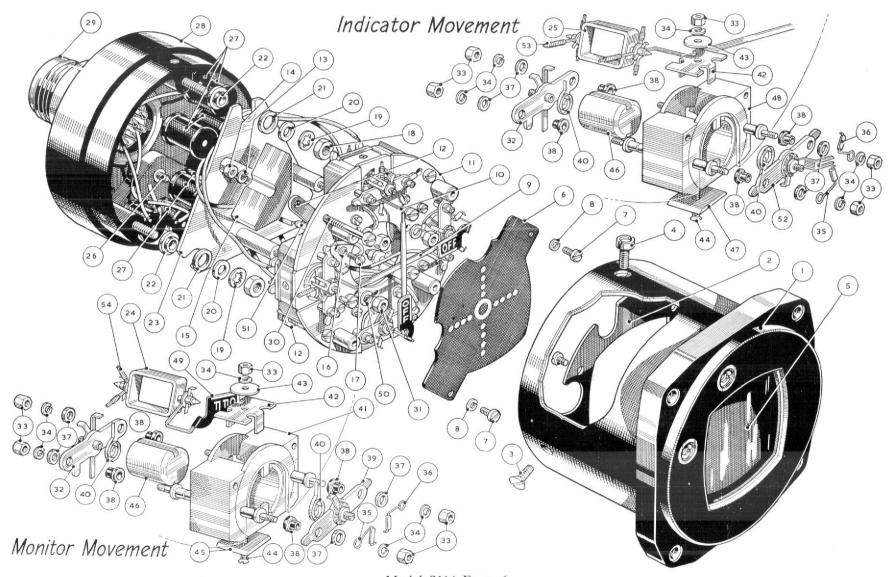
Model S114 Form 6





# PARTS LIST MODEL S114, FORM 6.

Reference		De	escriptio	on					Part No.	No. Of
1 2 3	Cover Assem Mask for Cover								166955 164676 150146	1 1 4
4 5 6	Sealing Screw 6BA. Sealing Cup Dial Fin								168862 168013 164718	2 2 1
7 8 9	Screw 10BA. × 3 " (Scale) Lock Washer 10BA. Pointer Assem. L.H								156396 159306 164705	2 2 1
10 11 12	Pointer Assem. Upper Mounting plate Assem. Magnet Clamp					••			164704 164681 164713	1 1 4
13 14 15	Lock Washer 8BA Nut 8BA Magnet				**				103854 150168 154712	8 8 4
16 17 18	Lock Washer 10BA. Screw 10BA. CH.HD. ½ lg Screw 12BA. CH.HD. ½ lg								153367 155546 150122	8 8 8
19 20 21	Lock Washer 12BA. Terminal Tag 8BA. Sub-Mtg. Plate Ass								155830 164637 166958	8 1 1
22 23 24	Nut 6BA Lock Washer 6BA Base (Well Type)								150166 156976 168576	9 9 1
25 26 27	Mtg. Plate Pillar Mtg. Plate (Well Type) Screw 10BA. × 36 (Spool)						#		166966 168616 150330	3 1 8
28 29	Lock Washer 10BA. (Spoo Spools	l) 		**					153367 Specify Letter and Code No.	8
30	Base Drilled	• •							166926	1
31 32 33	12 Pin Plug Sub-Mtg. Plate Pillar Nut 12BA	••				• •		• • • • • • • • • • • • • • • • • • • •	164717 166965 155125	1 3 20
34 35 36	Lock Washer 12BA. Pointer Stop L.H. Pointer Stop R.H.		::						155830 164711 164710	20 4 4
37 38 39	Bridge Insul. Washer Bridge Insul. Bush Bridge Ass. Top (Flag)								154399 154397 164696	16 16 2
40 41 42	Spring								156895 168480 157521	8 2 4
43 44 45	Washer 12BA. Large Core Screw 12BA Core Plate (Flag)								159596 155584 164715	4 4 2
46 47 48	Core .4" Core Plate (Pointer) Pole Piece Assem. (Pointer)						**		155580 164714 168481	4 2 2
49	Flag Assem								164698 167110 167111	Specify 2
50 51	Counter Weight Moving Coil Wd. (Monitor	Mov	v.)						157241 Specify Code	2 2
52 53	Bridge Ass. Top (Upper) Bridge Ass. Top (L.H.) Bridge Ass. Bott								164692 \\ 164690 \\ 164694	2 4
54	Moving Coil Wd. (Indicate Balance Weight	r Mo	ov.)						Specify Code	As require



Model S114 Form 6



# PARTS LIST MODEL S114, FORM 6.

Reference		De	escripti	on					Part No.	No. Off.
1 2	Cover Assem Mask for Cover	• •							166955 164676	1
3	Screw 6BA. Cover		**	* *	14.41	*114		***	150146	4
4	Sealing Screw 6BA.								168862	2
5	Sealing Cup								168013	2
6	Dial Fin								164718	1
7	Screw 10BA. $\times \frac{3}{16}''$ (Scale)	)							156396	2
8	Lock Washer 10BA.								159306	2
9	Pointer Assem. L.H								164705	1
10	Pointer Assem. Upper								164704	1
11	Mounting plate Assem.							101	164681	1
12	Magnet Clamp	**	1.1						164713	4
13	Lock Washer 8BA								103854	8
14	Nut 8BA								150168	8
15	Magnet		19		• • •	•••	• •	• •	164712	4
16	Lock Washer 10BA.								153367	8
17	Screw 10BA, CH.HD. 1 1								155546	8
18	Screw 12BA, CH.HD. 1/8 1	g.			• •				150122	8
19	Lock Washer 12BA.								155830	8
20	Terminal Tag 8BA.							15.5	164637	1
21	Sub-Mtg. Plate Ass	• •	• •	• •	• • •	• •			166958	1
22	Nut 6BA				*0*				150166	9
23	Lock Washer 6BA				2.02				156976	9
24	Base (Well Type)	• •	• •	• •		• •	• •		168576	1
25	Mtg. Plate Pillar								166966	3
26	Mtg. Plate (Well Type)	٠.			***		476		168616	1
27	Screw 10BA. $\times \frac{3}{16}$ " (Spool	)	• •		• •	• •	***	* *	150330	8
28	Lock Washer 10BA. (Spo	ol)							153367	8
29	Spools								and Code No.	
30	Base Drilled									1
50							• •		The same of property of the same of the sa	
31	12 Pin Plug								164717	1
32 33	Sub-Mtg. Plate Pillar Nut 12BA								166965 155125	3 20
34	Lock Washer 12BA.								155830 164711	20 4
35 36	Pointer Stop L.H Pointer Stop R.H				• • •				164710	4
37	Bridge Insul. Washer								154399 154397	16 16
38 39	Bridge Insul. Bush Bridge Ass. Top (Flag)						• • •		164696	2
							8500			
40 41	Spring: Specify Flag or I Pole Piece Assem. (Flag)	Pointer	Movt.	and I	nst. Co	de No.			168480	8 2
42	Core Clamp					51.5			157521	4
42									150506	4
43 44	Washer 12BA. Large Core Screw 12BA		• •	• •	• •				159596 155584	4
45	Core Plate (Flag)			* *					164715	2
	G 4"			_					155500	4
46 47	Core .4"								155580 164714	4 2
48	Pole Piece Assem. (Pointe								168481	2
	C Elag Assent								164698 )	
49	Flag Assem								167110 >	Specify 2
	Flag Off Lower	***							167111	-
50	Counter Weight	n M-							157241 Specify Code	2 2
51	Moving Coil Wd. (Monito	01 IVIO	v.)	***	• •	• •	**	• •	specify Code	
52	∫ Bridge Ass. Top (Upper)								164692	2
52	Bridge Ass. Top (L.H.)								164690 } 164694	4
53 54	Bridge Ass. Bott. Moving Coil Wd. (Indicat	or Mo	v.)	***					Specify Code	2
	TINTING COLL IT WE (IIIIII)									



