

## Chapter 3

## HEIGHT LOCK TRANSDUCER, TYPE A, Ref. No. 6A/5935

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**General**

1. The height lock transducer, Type A (fig. 1) does not form part of the air data system but as the fundamental design is similar to that of static transducer the descriptive details are being included in this section. The transducer provides barometric height information for use by the autopilot in its height lock mode of operation.

2. The height lock transducer is housed in a transducer mounting tray, Type B, Ref. No. 6A/5937, into which it is guided by means of locating dowels fitted to the rear of the chassis, and to which it is secured by the captive screws mounted on the front of the chassis. The unit measures approximately 6 by 5 by 6½ inches and weighs approximately 5½ lb.

3. A 25-way plug, HL1, is mounted on the front panel, and an orifice labelled STATIC is provided for an adapter of ⅜ in. outside diameter; this

adapter connects the transducer to the static line from the aircraft's pressure head. The transducer is protected by a cover which may be removed after unscrewing the two retaining screws at the rear of the unit. No external controls are provided. A warm-up period of three minutes is required prior to operational use.

**Summary of operation**

4. The height lock transducer consists of a capsule unit and a servo mechanism, and converts static pressure into a signal voltage representative of barometric height. A follow-up system maintains this voltage at zero until disconnected by a signal from the autopilot computer when the height lock mode is engaged. Subsequent changes in height of the aircraft produces a voltage from the transducer which represents the change in height from the stored barometric reference datum. This signal output is fed to the autopilot computer and processed to provide a correc-

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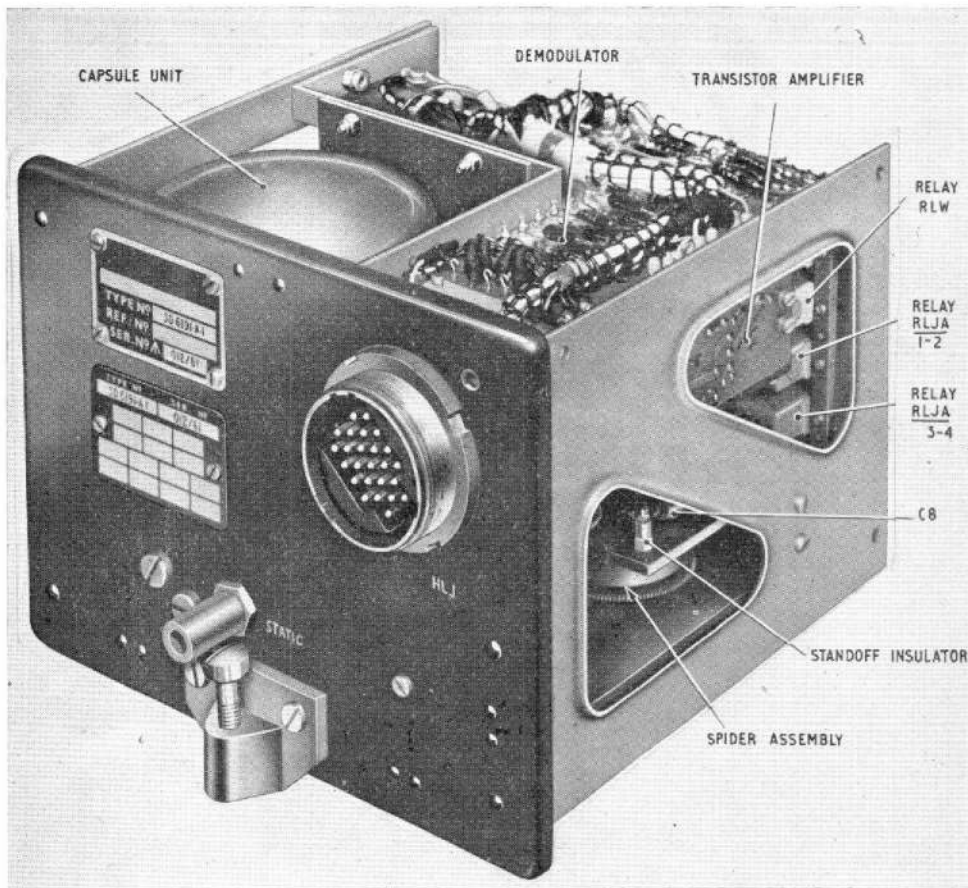


Fig. 1. Height lock transducer, Type A — cover removed

tive autopilot demand signal proportionate to the rate of change of height.

5. The displacement of the capsule is linear with pressure, as a function of height, over the range—1,000 to 50,000 ft within the temperature range  $-20$  to  $+50$  deg C, and the transducer can be locked at any height within this range.

6. The height lock transducer (fig. 7) is controlled remotely by the selection of height lock mode. When this is selected, relay RLW operates and the contacts (a) disconnect the servo amplifier stage at the input to the transistor amplifier TA<sub>1</sub>, and transfer this input to the buffer amplifier, (para. 34) and (b) disconnect the 50V supply to the motor-tachogenerator. This in effect disconnects the servo loop and locks the transducer follow-up system at the height selected. Should the aircraft height change, an error signal from the capsule unit is amplified in the buffer amplifier and applied to the autopilot computer.

#### Power supplies

7. The unit contains a single transformer T1 which is fed with 50V 400 c/s, phase A and B, this supply being obtained from the autopilot computer via a junction box. T1 provides the following outputs:—

- (1) 8V 400 c/s tachogenerator excitation voltage.

- (2) 7.5V-0-7.5V reference voltage for the demodulator.

- (3) 6V a.c. supply to the primary winding of the capsule unit E coils.

8. Various other power supplies are obtained from the following:—

- (1) Autopilot computer,
  - (a) +9V and -6V for the transistor amplifier and buffer amplifier.
- (2) A.D.S. power supply unit.
  - (a) 50V 400 c/s supply for the motor reference winding.
  - (b) -30V d.c., 85V 400 c/s (AC1) and 85V 400 c/s (AC2) for the magnetic amplifier.

9. These supplies are listed together with their application within the transducer in Table 1.

#### Relays (fig. 7)

10. Five relays are mounted on the chassis assembly and function as follows:—

- (1) RLW operates when the height lock mode is selected. RLW contact 1 breaks the 50V 400 c/s reference supply to the motor and RLW contact 2 re-routes the pick-off coils output from the servo amplifier to the buffer amplifier.

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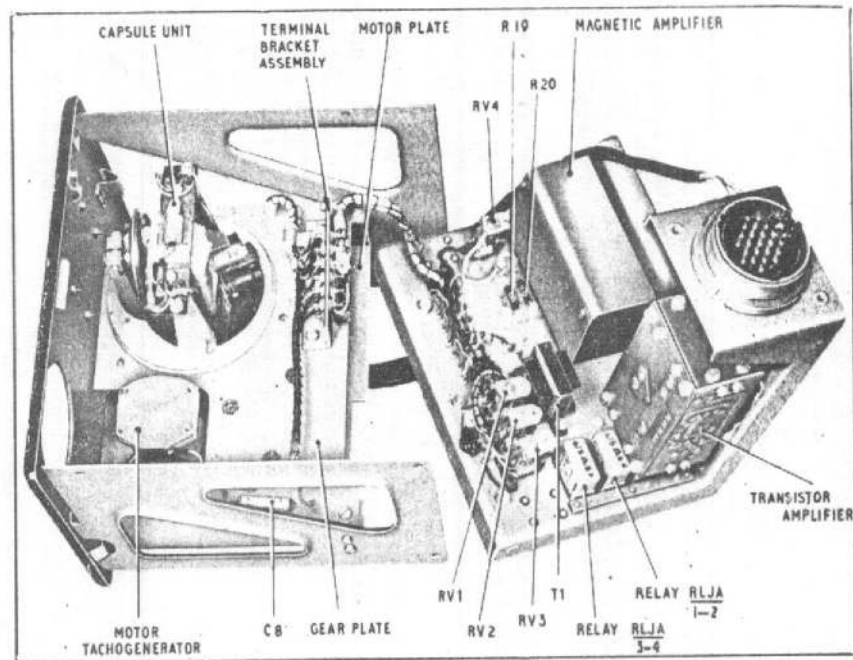


Fig. 2. Height lock transducer Type A—interior view

(2) RLJA contact 1 controls the 50V 400 c/s reference voltage to the motor. Contact 1 is made when plug H11 is connected to the transducer. The d.c. supply for RLJA is obtained by the introduction of the rectifier network MR5, MR6 and C8 across the 50V 400 c/s supply from the autopilot computer to transformer T1. Contact 2 of this relay is not used.

(3) RLA, RLJA/3-4 and RLZ are not used.

**Note . . .**

*RLJA consists of two separate relays. In this chapter, the relay bearing contacts A1 and A2 has been identified as RLJA/1-2 and the other relay as RLJA/3-4. The latter relay is not used.*

**Assembly (fig. 2)**

11. The transducer consists of a front panel, side frames and chassis assembly, supporting a gear plate and a motor plate. The gear plate and motor plate are suitably drilled to house or support the various components, bearings and drive spindles associated with the gear train. The transducer consists of a static capsule unit and a servo system incorporating the following:—

(1) Servo amplifier; comprising a transistor amplifier, a demodulator and a magnetic amplifier.

**Note . . .**

*Although referred to as sub-assemblies, both the transistor amplifier TA1 (Elliott Part number 3C5161) and the magnetic amplifier MA1 (Elliott Part number 3C635) are separate and replaceable units.*

(2) Gear train incorporating a motor-tachogenerator and a spider and shaft assembly (para. 37).

12. A buffer amplifier (para. 34) is included to amplify any error signals from the capsule unit pick-off coils when height lock mode is selected.

13. The various components of the servo amplifier, the buffer amplifier, transformer T1 and the capsule unit are mounted on the main chassis assembly.

### STATIC CAPSULE UNIT

#### Description

*General (fig. 3)*

14. This unit consists of a chamber fitted with an adapter which is the inlet for static pressure. Sealed outlets are provided in the base for terminals through which are routed the electrical connections for the thermostat switch and pick-off coils. A further outlet in the base, sealed by a synthetic-rubber 'O' ring, is provided for the spindle. A detachable cover, also sealed by an 'O' ring, fits over the collar of the base plate and a 40 watt heater element surrounds the cover. The heater is not used.

15. The design of the capsule unit provides for the following:—

(1) The rigid support of the capsule by means of the capsule bracket and bearing housing assembly and capsule support.

(2) Conversion of the capsule expansion and contraction into angular movement of the vane. As the capsule expands or contracts the capsule adapter carries with it the

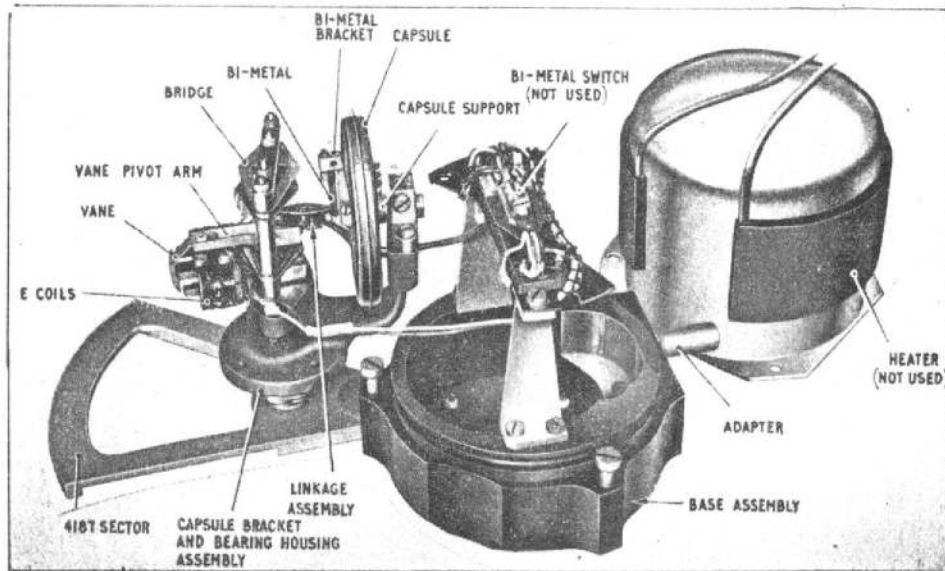


Fig. 3. Capsule unit

bi-metal support into which is screwed the bi-metal strip assembly. A link (*fig. 4*) engages a jewel bearing in the lower, or free end of the bi-metal assembly and transmits capsule movement to a jewel mounting assembly, mounted on and locked with a locknut to a ratio arm adjusting screw. This screw is mounted off centre in the block of the vane pivot arm, which is pivoted about a vertical axis and which swings about this axis in response to linear movements of the capsule adapter and linkage. The vane is clamped in a slotted extension arm of the vane pivot block and its outer end is bent downwards so that it lies in close proximity to the poles of the pick-off coil assembly; the gap between the vane and the poles may be adjusted by moving the vane in the slot before clamping with the screw. As the capsule expands or contracts the vane thus swings about the vane pivot axis, the degree of movement of the vane being controlled by

the ratio arm, which may be rotated on the screw (before being locked with the locknut) to adjust the effective radius of the linkage attachment point.

(3) Conversion of the movement of the vane into an error signal by means of the variable-reluctance pick-off (*fig. 3*). The E coils, on their laminations, are attached directly to the spindle by means of the clamp. The coned spindle and E coils are free to rotate over a limited arc, and are supported by two sets of bearings housed in the combined capsule bracket and bearing housing assembly. The upper and lower bearings support the coned spindle and are secured by means of a cup shaped locking ring. This cupped locking ring can be adjusted to prevent 'end float' at the lower bearing end of the bearing housing, and can be locked into position by means of an outer locking ring. The upper and lower ends of the spindle are sealed by synthetic-rubber 'O' rings. The spindle and part of the bearing housing protrudes through the base of the capsule assembly. The lower end of the spindle is clamped to the 72 degree sector which meshes with gear 84T on axis 4.

16. Provision is also made for the correction of errors arising from varying temperature coefficients, and compensation of errors arising from 'g' forces.

(1) Temperature error correction. The bi-metal strip assembly is adjusted, during the calibration of the capsule unit, to compensate for the net error arising from the effects of temperature changes on all parts of the unit. The bi-metal bends with changing temperature resulting in horizontal movement of the jewel bearing at its lower end; the component of this movement which is transmitted through the linkage is controlled by the direction in which the bi-metal strip faces, and

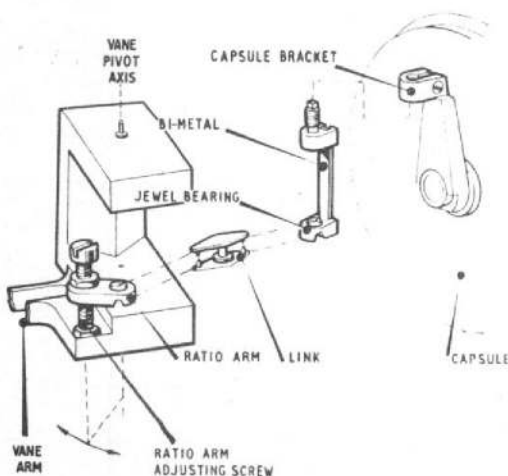


Fig. 4. Capsule unit linkage

rotation of the bi-metal assembly (before clamping in the bracket) is thus a means of adjusting the temperature correction.

(2) Error arising from 'g' forces are counter-balanced by the capsule balance weight, the vane arm balance weight and the leaf spring assembly supporting jewel mountings in which pivots the vane arm.

#### Capsule

17. The static pressure capsule is constructed of corrugated beryllium-copper cheeks joined with non-corrosive solder and fitted with the support and the adapter. A short length of copper tubing is crimped after the capsule has been evacuated to approximately  $22.5 \times 10^{-6}$  mm Hg.

#### Principle of operation

18. When an aircraft changes altitude, either by increasing or decreasing height with respect to sea level, a corresponding change in barometric pressure results, pressure increasing with loss of height, and decreasing with height gained. The pressure change influences the aneroid capsule assembly which expands with increasing height and contracts with decreasing height. This movement is magnified in the linkage system (*fig. 4*) and transmitted to the rotating arm to which the moving-iron armature (vane) of the variable-reluctance pick-off is attached.

19. The variable-reluctance pick-off uses magnetic coupling in order to measure the difference between the position of the vane (source of motion) and the spindle (source of error signal) and this forms the error detector of the transducer servo-mechanism. It consists essentially of the two-magnetic structures, one in the shape of an E (pick-off coil) and the other in the shape of an I (vane). In the absence of pressure change, no movement is imparted by the capsule, the vane, assuming the servo follow-up action is complete, is symmetrically positioned in relation to the pick-off coil and the output from the pick-off is a minimum signal or null. A change of pressure results in the movement of the vane away from the null position, and a consequent output signal from the pick-off coils. This output is amplified and used to drive the motor-tachogenerator in the null-seeking direction.

20. The circuit of the variable-reluctance pick-off is given in *fig. 6* from which it can be seen that a 6V 400 c/s supply is fed to the E coil primary from the secondary of T1, the E coil primary being wound coaxially with the secondary on the outer limbs of the E core. If the vane is in its centre position, equal voltages are induced in the series-aiding secondary coils, the bridge network is therefore balanced (RV4 being adjusted to this condition) and no output is produced across the load resistor R1. When, due to the expansion or contraction of the capsule, the vane is moved, the air gaps between

the E and I cores are no longer equal, increased flux is carried in the limb having reduced reluctance, and decreased flux is carried in the limb having increased reluctance. In this manner the voltage induced in one coil increases while that induced in the other decreases. The bridge is no longer balanced and an output voltage of a certain magnitude and phase appears across the load resistor R1. This error signal is power-amplified in the servo amplifier and fed to the control winding of the motor, the reference phase winding of which is supplied with 50V 400 c/s in quadrature with the 50V 400 c/s supply from the autopilot computer, fed via pins S and R of HL1. The phase of the pick-off voltage is also related to this reference voltage, so that the direction of rotation of the motor is such as to cause the servo loop to seek the pick-off null.

#### SERVO SYSTEM

##### Servo amplifier (*fig. 6*)

21. The purpose of the servo amplifier is to provide a suitable a.c. power output which is related in amplitude and phase to the error signals from the capsule unit, the output from the servo amplifier being the command signal driving the motor-tachogenerator and associated gear train. The servo amplifier consists of a transistor amplifier, a phase sensitive demodulator and a magnetic amplifier; the overall gain, with feedback, being in the region of 130 000.

##### Transistor amplifier

22. The transistor amplifier is a printed-circuit sub-assembly. It is positioned by the right-hand side frame and is secured by four screws to the underside of the top section of the chassis assembly. The remaining components of the amplifier are situated on the top of the chassis assembly.

23. The circuit consists of an input stage, resistance-capacitance coupled to a drive stage, coupled by a phase-splitter transformer to a Class B push-pull output stage. Germanium PNP junction transistors are used. The input impedance is 800 ohms. The input signal is fed to the base of VT1 (OC73), which has +9V bias applied to the emitter, via R4 decoupled by C2, and -6V to the collector. VT1 is resistance-capacitance coupled via R3, C3 and R6 to VT2 (OC73), which operates with the same emitter and collector voltages as VT1 and is biased via R7, decoupled by C5. The phase-splitter transformer T1, couples VT2 to the output stage, the primary being tuned by C4 and C6 to give maximum gain at 400 c/s. Bias for the emitters is derived from the currents through R10 and R11. Because of the temperature dependence of the emitter-base junction characteristic, optimum bias falls with temperature and some form of temperature compensation is necessary to maintain correct threshold bias. This thermal stabilization is achieved by the use of diode MR1 in the bias circuit, since the diode characteristic is also temperature dependent and in such a direction as

to compensate thermally (upon certain conditions) the base circuit at low to medium temperatures. The collectors are fed with  $-6V$  via the centre tap of T2 which is tuned by C7 for maximum gain at 400 c/s. T2 matches VT3 and VT4 into the output load.

#### Demodulator

24. The demodulator circuit consists of the silicon diode rectifiers MR1, MR2, MR3 and MR4 and the four 68 ohm resistors R9, R10, R11 and R12, all of which are mounted on the top of the chassis assembly above the transistor amplifier. The demodulator may be considered as a change-over switch arranged in such a manner that the phase reversal of the signal input will reverse the current flow in the control windings of the transducers, so reversing the phase of the amplifier output which in turn reverses the rotation of the servomotor. The demodulator thus functions as a phase sensitive network in which the phase of the signal voltage is compared with the phase of the reference voltage. The  $7.5V - 0 - 7.5V$  reference voltage is obtained from the transformer T1, which is located on the rear of the chassis assembly. The primary of T1 is fed with a 50V 400 c/s supply from the autopilot computer.

#### Magnetic amplifier

25. The magnetic amplifier is a sub-assembly of conventional design which delivers 5 watt a.c. power to the control winding of the motor-tachogenerator. The input resistance is 74 ohms, the current gain at 4mA d.c. input is 20, and a maximum output of 120mA r.m.s. is available as a command signal to the motor-tachogenerator, which is tuned to 400 c/s by capacitor C8 in parallel with the control winding. The sub-assembly is mounted on the underside of the top section of the chassis assembly.

26. The circuit of the magnetic amplifier consists of two matched transducers each with two silicon diode rectifiers MR1 to MR4, with R1 and two pre-set resistors RV1 and RV2 controlling the bias circuit. All components are suitably mounted on a metal chassis. Internal connections are made via tagboards located at each side of the chassis. The sub-assembly is provided with a flux shield.

27. The sub-assembly functions as a Class B magnetic amplifier connected in such a manner as to provide a load current which is the difference between the a.c. currents flowing in the transducers. The transducers are fed from the opposite ends of a centre-tapped 85V-0-85V 400 c/s supply (AC1 and AC2 respectively) and the phase of the load current is therefore reversed when the direction of the control current reverses.

28. The transducer operating points are set independently by means of the internal preset resistors RV1 and RV2, the bias current being derived from the  $-30V$  d.c. supply. These bias control potentiometers are adjustable through two access holes in the chassis.

29. In the servo amplifier system there is a possi-

bility of an unwanted signal arising from mismatching of the demodulator components and any slight out of balance of the magnetic amplifier, with the result that the E coils are offset from the true null when the servo loop action is complete. To eliminate this a phase correcting network consisting of RV2, R26, R27 and R28 is introduced across the  $7.5V-0-7.5V$  winding of T1. RV2 is adjusted during setting-up so that the network provides a signal of opposite phase and magnitude which will counter balance any spurious signals arising.

#### Inputs to servo amplifier

30. The inputs to the servo amplifier are summed at tag 'a' on the transistor amplifier and consist of error, damping, and overall feedback signals as follows:—

(1) The error signal derived from the pick-off coils of the capsule unit is fed to the amplifier via the load resistor R1.

(2) An angular-velocity feedback signal (damping signal) is derived from RV3 which is across the output winding of the tachogenerator. This signal is fed via the load resistor R6, and has a range of 0 to 2.75V r.m.s.

(3) An overall feedback signal is developed from the servo amplifier output via the T network comprising R21, R22 and R23. This signal stabilizes the gain of the servo amplifier, improves the low frequency response, and removes unwanted time lags from the servo loop.

#### Motor-tachogenerator (fig. 7)

31. The motor-tachogenerator consists of a 2-phase, 2-pole squirrel cage motor with a 4-pole tachogenerator mounted on the same shaft. The reference phase of the motor section is energized by the 50V 400 c/s reference supply, which is switched on and off by relays RLW1 or RLJA, and the control winding is fed with the power-amplified command signal from the output of the magnetic amplifier, this voltage being in time phase quadrature with the reference voltage. The resultant rotating field causes the motor to rotate at a speed proportional to the amplitude of the command signal, the direction of rotation being determined by the phase of the command signal voltage, which may either lead or lag the reference voltage by 90 degrees. The motor spindle is connected by a pinion to the gear train.

32. The tachogenerator provides a sinusoidal voltage of constant frequency, but with an amplitude proportional to the angular velocity of the shaft. The generator has two stator windings, excitation and output. The excitation winding is fed with 8V a.c. derived from transformer T1.

33. The output from the generator is fed to the input of the servo amplifier as velocity feedback via the load resistor R6. A preset potentiometer RV3 is connected across the generator output winding to enable to maximum velocity

feedback signal to be varied between zero and 2.75V r.m.s. If the signal is inadequate, any disturbance will cause the servo to oscillate or hunt, whereas if the signal is too large the servo will be over-damped and sluggish. RV3 is adjusted during setting-up to provide a satisfactory measure of velocity feedback.

#### Buffer amplifier (fig. 7)

34. The buffer amplifier uses three silicon NPN junction transistors VT1, VT2 and VT3 and provides an input stage, emitter follower stage and an output stage for the purpose of amplifying the error signals from the pick-off coils of the capsule unit; the amplified signal is then fed to the autopilot computer. All components of this amplifier are mounted on the rear of the transducer chassis assembly. The error signal is fed to the base of VT1 via RV1 and C2. VT1 is in grounded emitter configuration, with a decoupling network R24 and C7; a d.c. stabilization effect is included with the introduction of R25. The output is taken from the collector load resistor R7 to the base of the emitter follower VT2. The emitter output is fed via the load resistor R14 and the blocking capacitor C3 to the base of VT3. R15/R16 is a potential divider network for the base stabilization of VT3. R17 is the load resistor and the output, which is proportional to the height error signal, is fed to the autopilot computer via C6 and HL1-Z. Emitter bias on both VT2 and VT3 is obtained by the current flow through R14 and R18 respectively. The emitter of VT3 is decoupled to SIG.E by C.5.

Overall negative feedback is achieved by feeding the output from the collector of VT3 via C4 and R13 to the emitter of VT1.

#### GEAR TRAIN (fig. 5)

##### General

35. The gear train is accommodated between the motor plate and a gear plate, certain parts of the gear train protruding beneath the motor plate. The gear and motor plate are drilled to house the capsule unit, which is bolted between the two plates, the motor-tachogenerator, which is mounted on the motor plate, and the associated gear train. Suitable bearings are provided for the various gear spindles and split clamps facilitate the removal of gears or components.

36. The gear train consists of five axes, axis 1 being the drive from the motor-tachogenerator. Aluminium alloy is the material used for the gears and stainless steel for pinions and spindles. All bearings are flanged ball bearings and are a light push fit in their housings and on the spindle. A split gear 84T (para. 40) is introduced on axis 4 to counteract backlash. Further compensation for backlash is made by the introduction of a small coiled spring between the sector and motor plate. To protect the gear train, a slip clutch (para. 39) is provided at axis 2.

##### Spider assembly

37. A planetary differential, the spider assembly is included in the gear train between the motor-tachogenerator and the spindle of the capsule

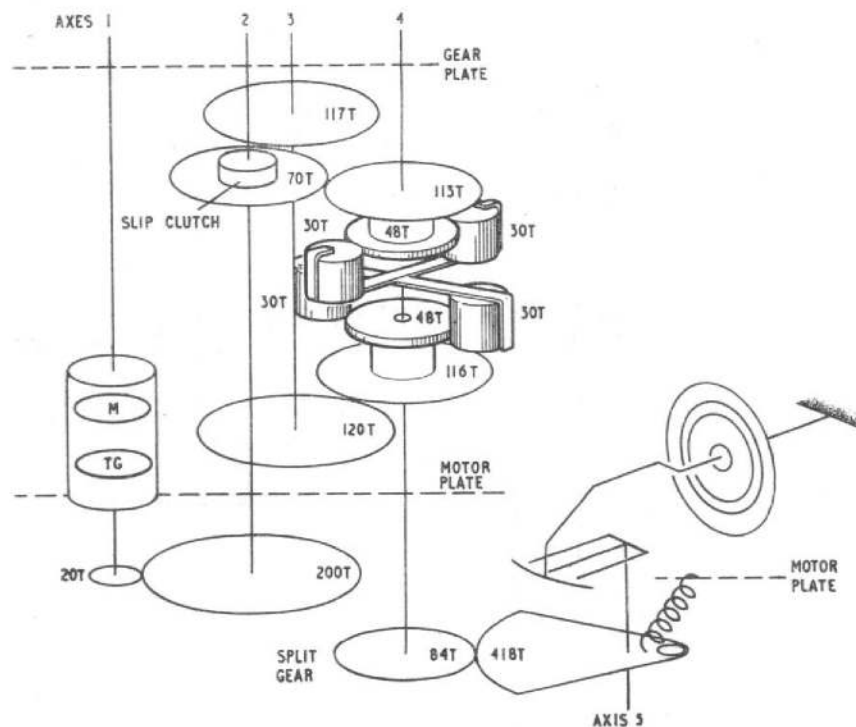


Fig. 5. Gear train—schematic

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unit. This assembly provides a large reduction ratio in the gear train, which would otherwise require numerous gears and pinions etc.

38. The motor drives into one side of the assembly at a ratio of approximately 16·14 : 1. The output of the assembly is the difference between these inputs and is equivalent to a further reduction of approximately 70 : 1. A further reduction of approximately 5 : 1 is provided between the assembly output shaft and the sector attached to the capsule unit spindle. An overall reduction of the order of 5600 : 1 is thus obtained between motor and capsule unit.

#### Slip clutch (overload clutch)

39. The slip clutch protects the gear train in the event of overload. It consists of a dished spring fitted on the intermediate gear spindle at axis 2, the gear (70 teeth) being freely mounted on the slip clutch boss and clamped against the spring by a split clamp. The split clamp is adjusted

so that the rotation of the spindle is transmitted to the gear on normal loads, but slips when the load is slightly below the overload rating for the motor.

#### Split gear

40. A split gear is a combination of two gears mounted coaxially, with abutting wheel faces, one gear being staked to a boss and the other free to rotate on the boss. The relative rotary position of the two gears is controlled by two coiled springs, each accommodated in a pair of slots in the gears. The pair of slots are diametrically opposite and one end of each spring is attached to each gear, with minimum tension on the springs the teeth of the two gears do not coincide. When meshed, the teeth of the two wheels of the split gear are forced more nearly into coincidence, increasing the tension on the springs and rotating the free gear slightly relative to the fixed gear. Thus both sides of the meshing teeth are in contact and backlash is reduced to a minimum.

TABLE 1

#### Power supplies

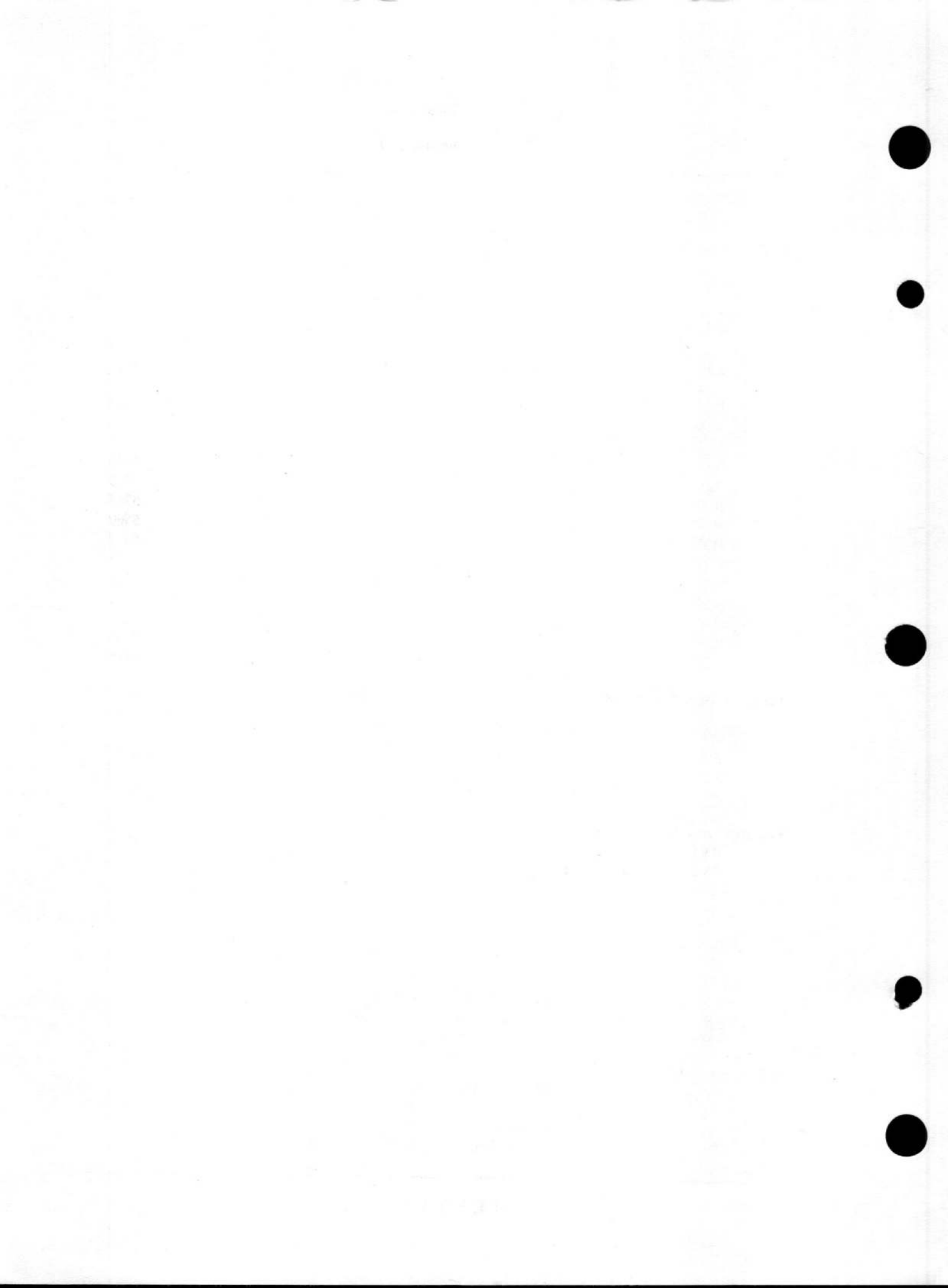
HLI	Supply	Application
S R	} 50V 400 c/s from autopilot computer	Transformer T1 8V excitation for tachogenerator 7·5V-0-7·5V for demodulator 6V for pick-off coil primary excitation.
O		Motor reference phase
M	+9V	TA1 emitter bias, VT1, VT2, VT3 and VT4 Buffer Amplifier Collector voltage VT1, VT2 and VT3
L	-6V	Collector voltage VT1, VT2, VT3 and VT4 (TA1) Buffer amplifier Emitter bias VT2 and VT3
K	-30V	Transducer bias and operation of heater circuit RLA/1 via bi-metal
G H	} AC1 AC2	Transducer load winding supply
D		115V (A)
C	115V (B)	Heater element (not used)

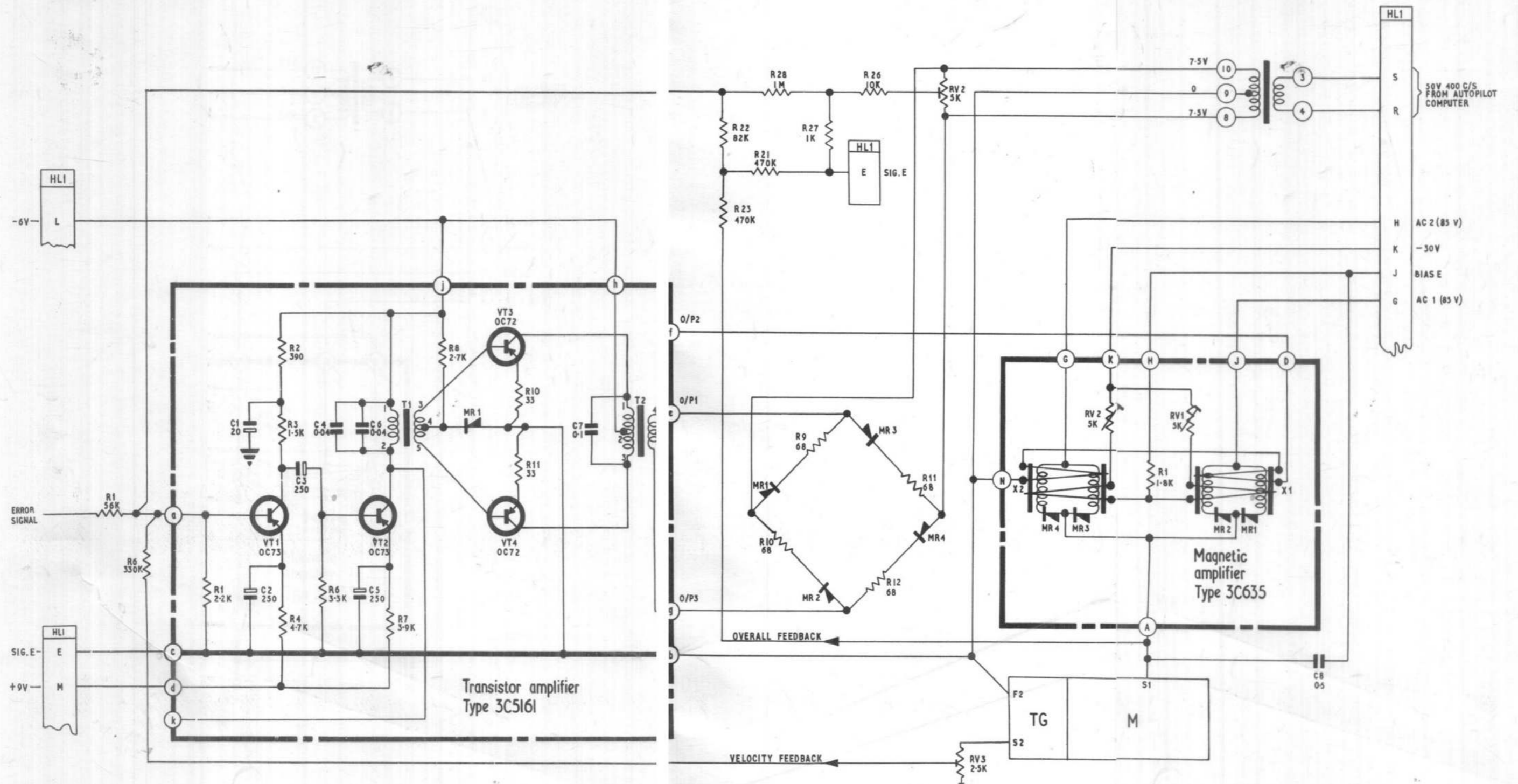
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TABLE 2  
Components list

Circuit Ref.	Value	Watts	Tolerance %	
Resistors, fixed carbon				5905-99
R1	5.6K	$\frac{1}{4}$	$\pm 2$	-021-5820
R6	330K	$\frac{1}{4}$	$\pm 2$	6928
R7	8.2K	$\frac{1}{4}$	$\pm 2$	5860
R8	100	$\frac{1}{4}$	$\pm 2$	5400
R13	10K	$\frac{1}{4}$	$\pm 2$	6211
R14	8.2K	$\frac{1}{4}$	$\pm 2$	5860
R15	39K	$\frac{1}{4}$	$\pm 2$	6350
R16	6.8K	$\frac{1}{4}$	$\pm 2$	5840
R17	4.7K	$\frac{1}{4}$	$\pm 2$	5800
R18	1K	$\frac{1}{4}$	$\pm 1$	5640
R19	2.2K	$\frac{1}{4}$	$\pm 1$	5715
R20	2.2K	$\frac{1}{4}$	$\pm 2$	5715
R21	470	$\frac{1}{4}$	$\pm 2$	5560
R22	82K	$\frac{1}{4}$	$\pm 2$	6430
R23	470K	$\frac{1}{4}$	$\pm 2$	6952
R24	2.2K	$\frac{1}{4}$	$\pm 2$	5720
R25	470K	$\frac{1}{4}$	$\pm 2$	6952
R26	10K	$\frac{1}{4}$	$\pm 2$	6211
R27	1K	$\frac{1}{4}$	$\pm 2$	5640
R28	1M	$\frac{1}{4}$	$\pm 2$	6966
Resistors fixed, wire wound				5905-99
R9	68	$\frac{1}{4}$	$\pm 5$	-011-3227
R10	68	$\frac{1}{4}$	$\pm 5$	3227
R11	68	$\frac{1}{4}$	$\pm 5$	3227
R12	68	$\frac{1}{4}$	$\pm 5$	3227
Resistors, variable wire-wound				
RV1	12K	1	10	
RV2	5K	1	10	
RV3	2.5K	1	10	
RV4	250	1	10	
Capacitors, tantalum pellet				
C1	1 microfarad	+50% -20%	25V working	
C3	30 microfarad	$\pm 20$	30V "	
C5	100 microfarad	$\pm 20$	6V "	
C7	75 microfarad	$\pm 20$	10V "	
C9	1 microfarad	—	70V "	
Capacitors, reversible, tantalum foil				
C2	1.25 microfarad	$\pm 20$	25V working	
C4	10 microfarad	$\pm 20$	12V "	
C6	10 microfarad	$\pm 20$	12V "	
C8	0.5 microfarad	$\pm 20$	150V "	

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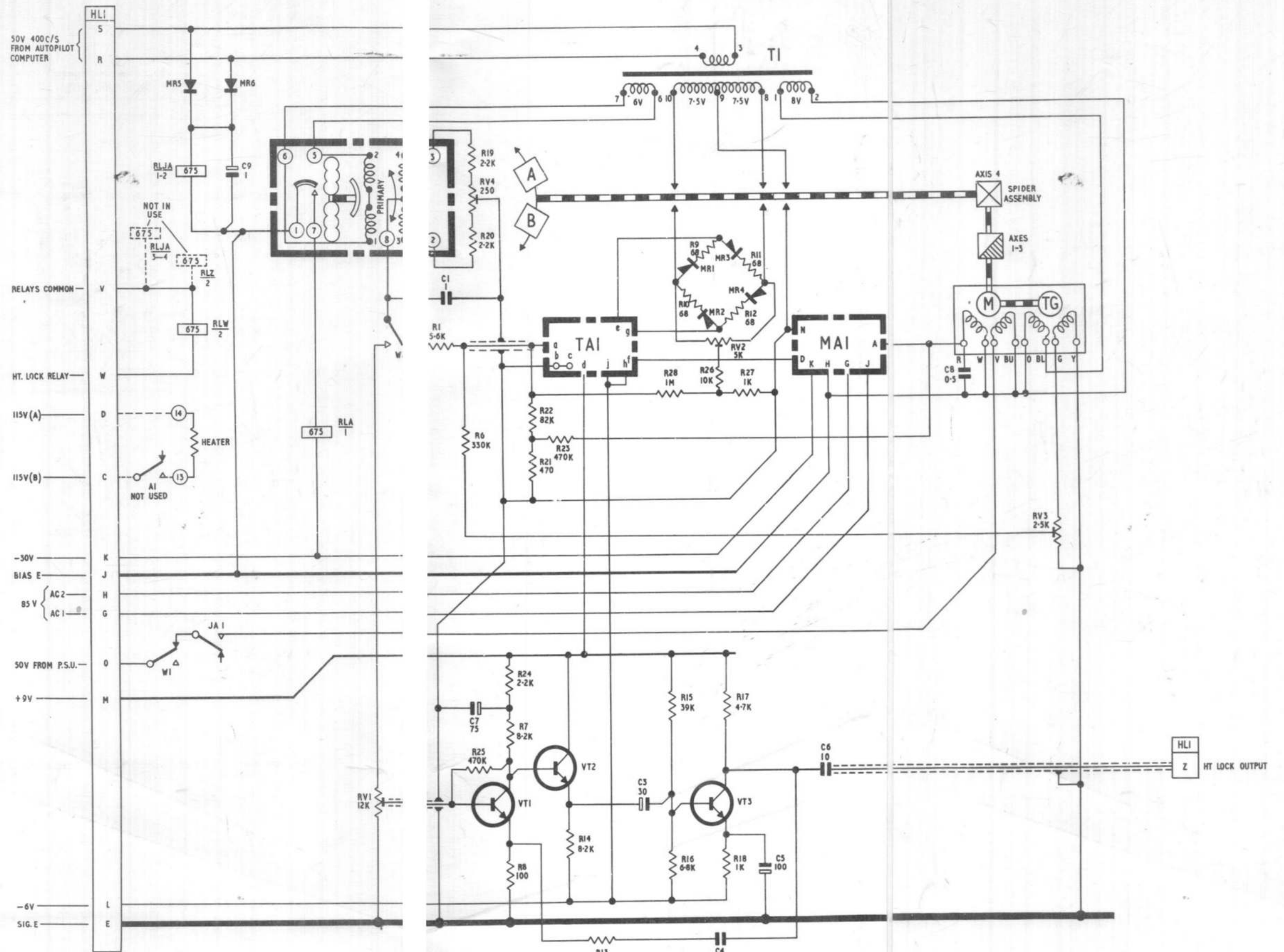


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AIR DIAGRAM  
6320 BP/MIN  
ISSUE 1  
ISSUED BY THE MINISTRY OF AVIATION  
FOR PROMULGATION BY  
AIR MINISTRY ADMIRALTY

Height lock transducer, Type A-servo amplifier  
RESTRICTED

Fig. 6



AIR DIAGRAM  
6320BQ/MIN  
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Height lock transducer Type A, Ref. No. 6A/5935-circuit diagram  
RESTRICTED

Fig. 7

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