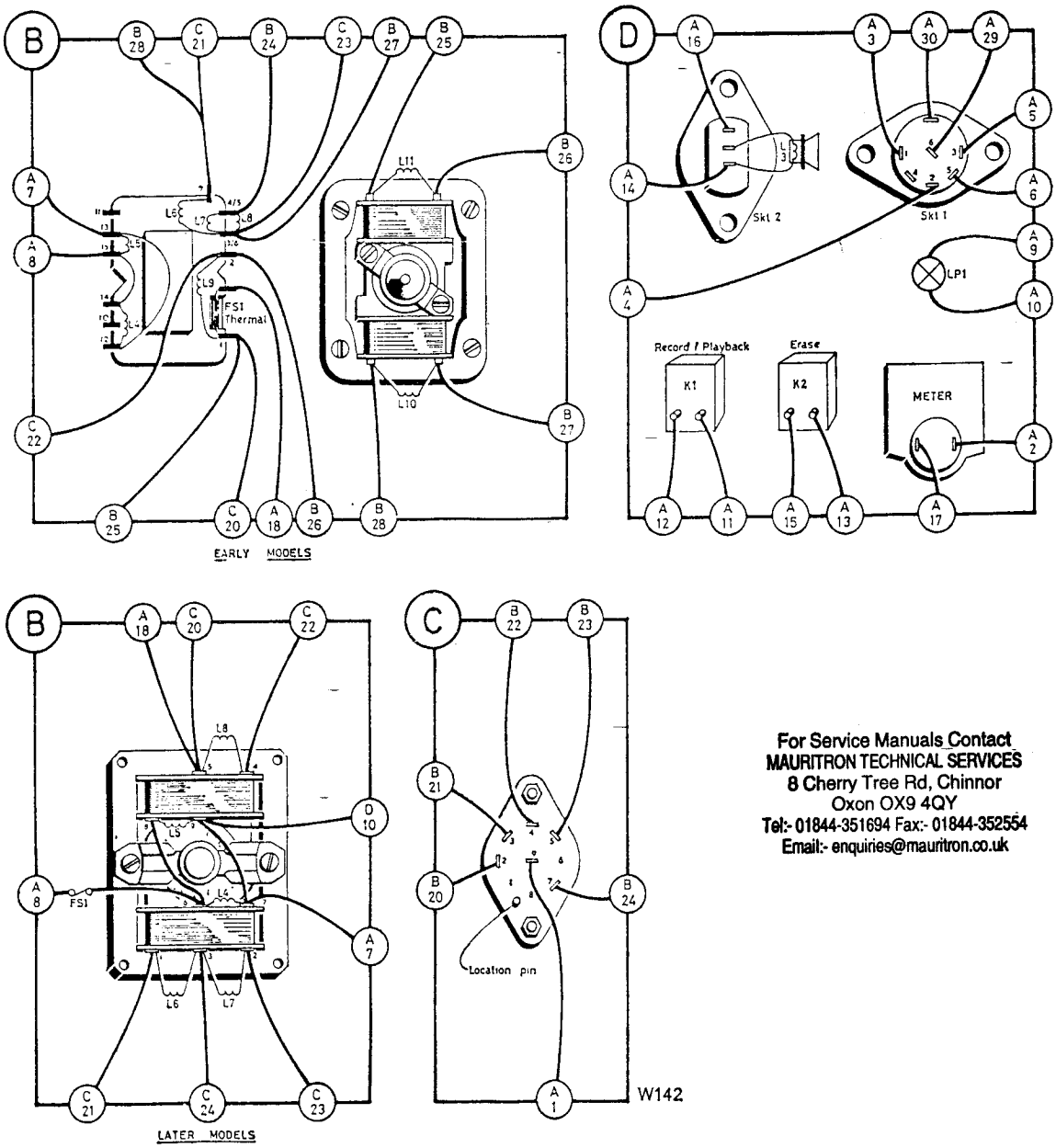
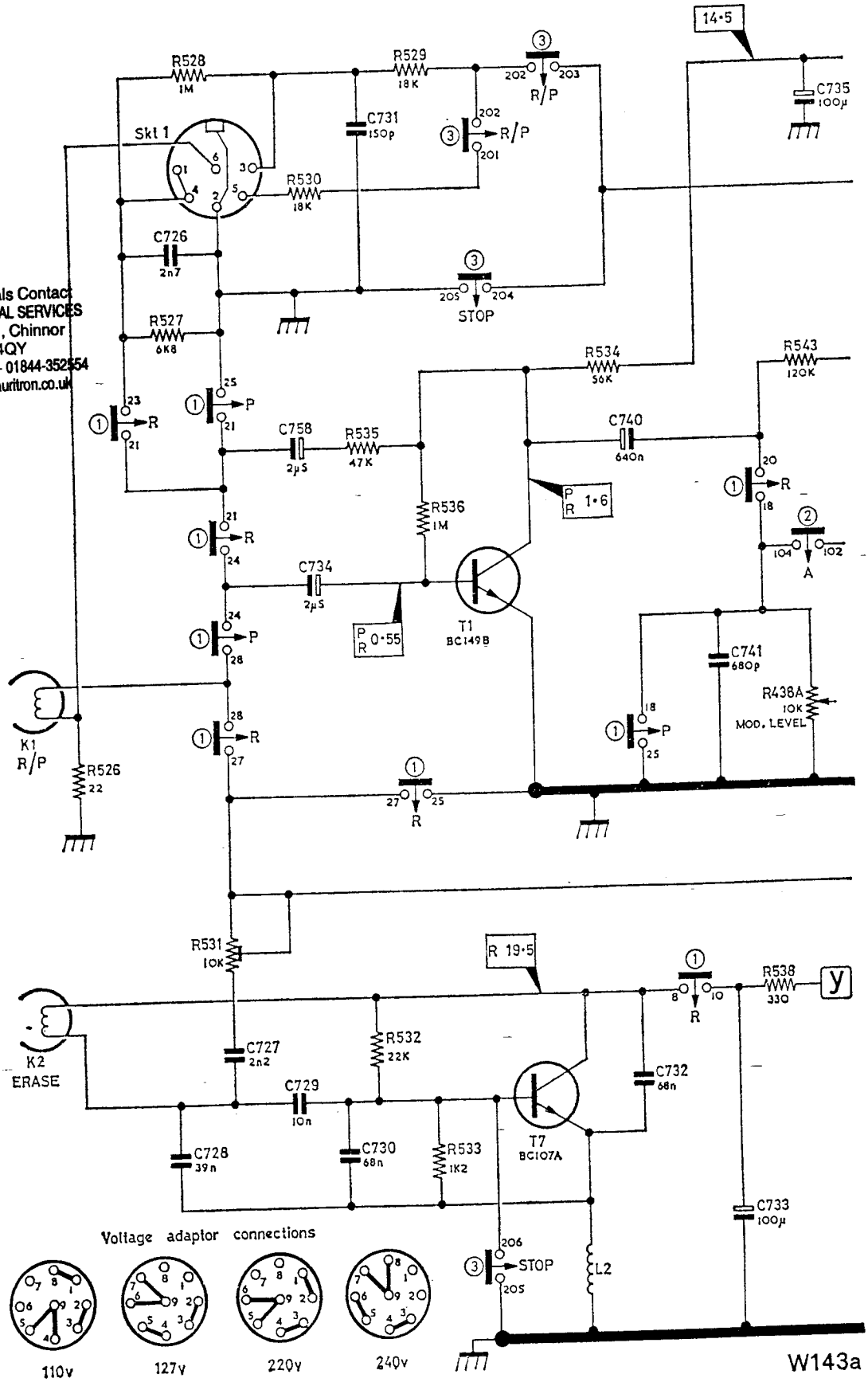
PHILIPS N 4302

General Description: The N4302 is a two-track single-speed mains-operated tropicalised tape recorder. A special circuit keeps the recording level correct when set to "Automatic" operation, with push button conversion to manual control when necessary. A moving coil modulation-level meter and a re-settable three-digit rev. counter are fitted.

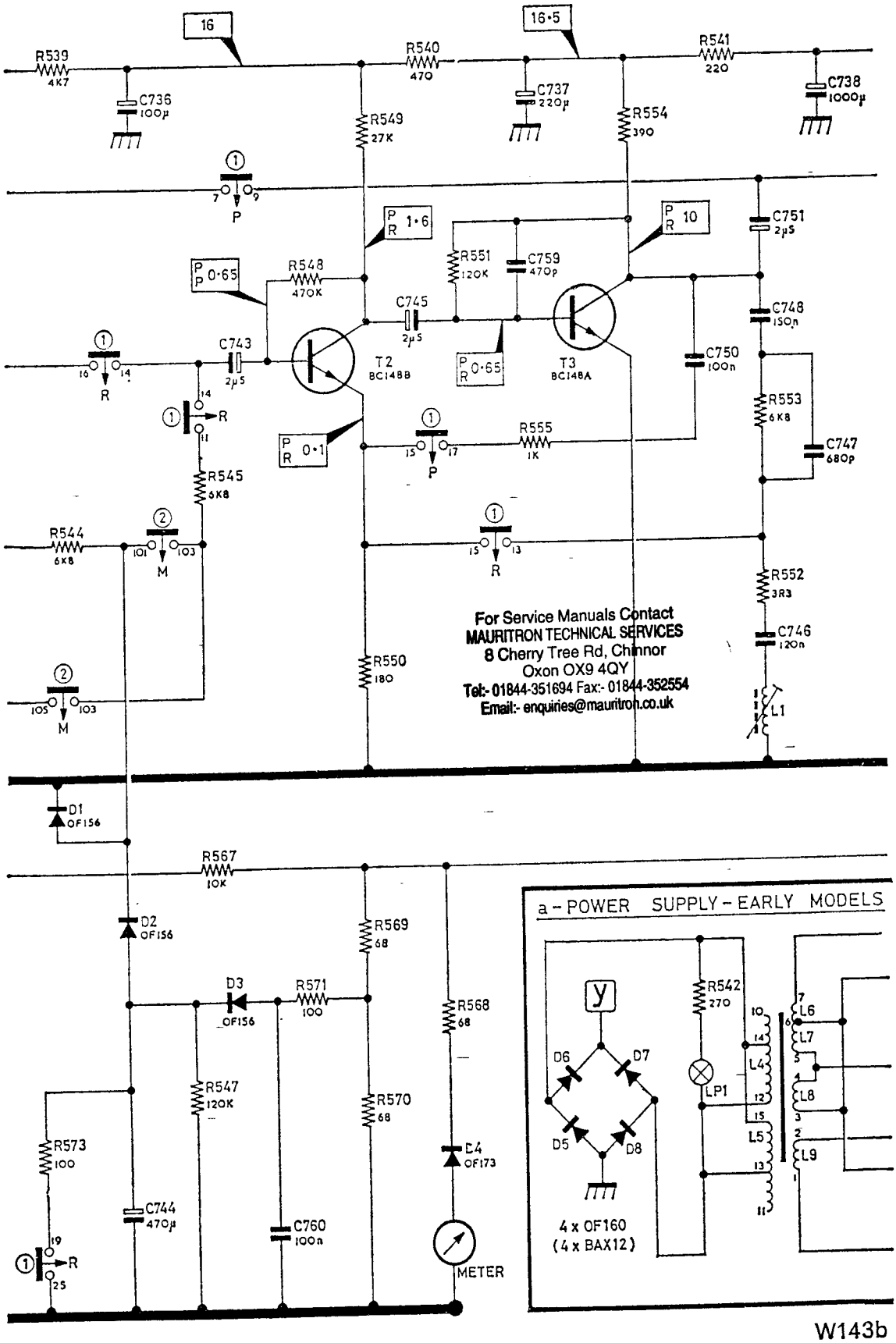
Mains Supply: 110, 127, 200–250V A.C., 50Hz (adaptable to 60Hz). Power output 1·5 watts.



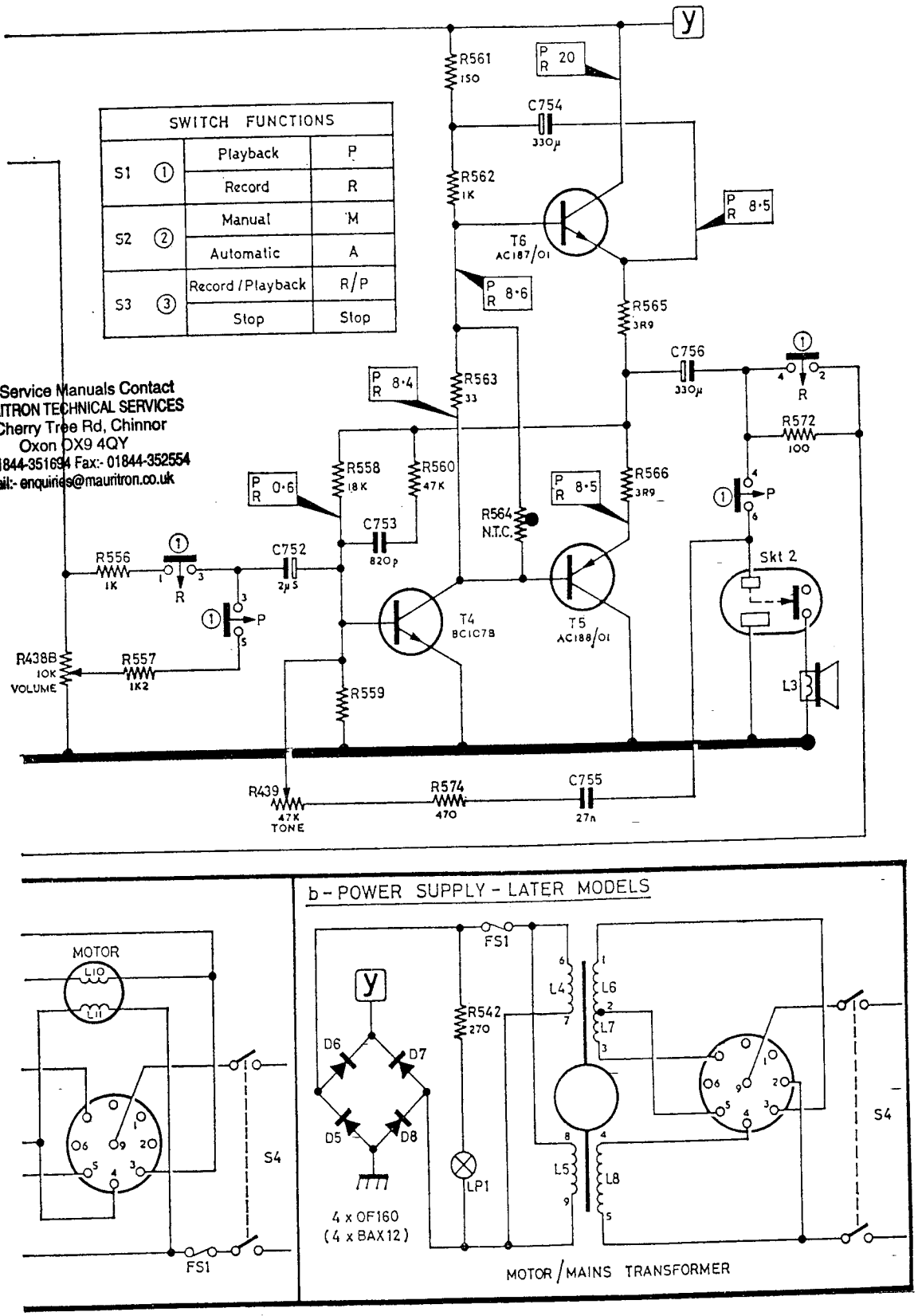
(W142) Component Wiring—Model N4302



(W143a) Circuit Diagram—Model N4302 (*Part*)



(W143b) Circuit Diagram—Model N4302 (*Part*)



W143c

Circuit Diagram Notes: Switches close only for functions indicated. Sockets viewed on solder tags. All voltages taken with respect to chassis using a 20k ohm/volt meter with no signal input, all controls at minimum and with 240 volts A.C. input to 240 volt tap.

(W143c) CIRCUIT DIAGRAM—MODEL N4302 (*Continued*)

Input/Output Socket: *Input—pins 1/4 and 2.* Microphone (direct) 0·2mV into 2kΩ; Radio (via EL3768/03 lead) 100mV into 1 MΩ; P.U. (via EL3768/03 lead) 750mV into 20kΩ.

Output—pins 3/5 and 2 : External amplifier 750mV from 20kΩ.

Loudspeaker: 4 in. circular, 8Ω impedance.

Warning: Do NOT switch off or disconnect the mains supply at some remote point to the recorder with the Play or Fast wind keys depressed. This practice will result in "flats" forming on drive surfaces and, subsequently, mechanical noise.

Operating Notes

Record (Automatic): Switch on by turning volume control clockwise. Depress Pause key, then depress the Record and Play keys simultaneously. Before releasing Pause key, allow a few moments for the automatic recording-level control to adjust to the correct level. On completion of recording, depress the Stop bar.

Record (Manual): Depress Pause key, then depress Record and Play keys simultaneously. Depress "Manual" push button and adjust the Modulation level (Volume) control so that the modulation level indicator pointer almost reaches the red segment of the scale during the loudest passages. Release the Pause key to commence recording. On completion of recording, depress the Stop bar.

When recording from a source other than a microphone, it may be necessary to include some form of attenuation in the input lead to prevent overloading of the input stage. The connecting lead supplied with the recorder, type EL3768/03, incorporates a 1·5MΩ resistor. The value of this resistor may be altered, under certain conditions, to provide a satisfactory recording.

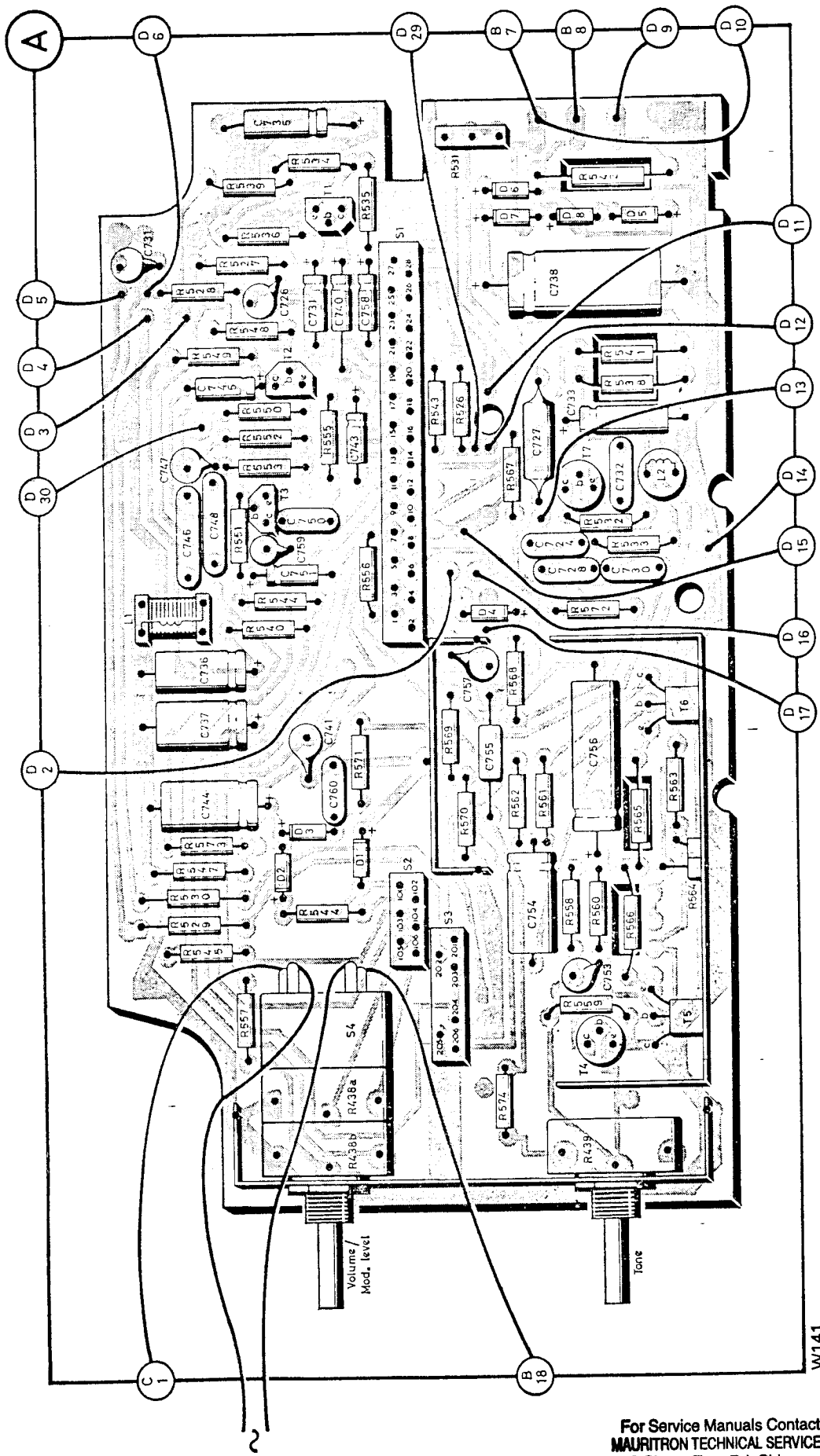
Dismantling Procedures

Case Removal: Detach the lid and invert the recorder. Use a long-bladed screwdriver to remove the four corner screws from the base moulding. Holding the two case sections together, turn recorder the right way up and carefully lift the top moulding away, exposing the main chassis. For access to the underside, raise the chassis from the four corner pillars. Before returning the chassis to the cabinet base, first ensure that all keys are UP and that record strip is in a position to engage the front edge of switch actuator.

Amplifier: Raise the chassis as described above, pull off the two front control knobs and disconnect screening ("Lucar") connector. Remove the two panel securing screws; one is adjacent to Skt2 and the other is near the rear corner of the output transistor heat sink. Release the printed panel by sliding it backwards to clear the cabinet wedges.

Adjustments

Record/Playback Head (Azimuth Setting): The azimuth setting of K1, the record/playback head, is adjusted by screw adjacent to the head. Place a



(W141) Component Layout—Model N4302

FULL TAPE WIDTH test recording of 8–10kHz on the recorder and connect an A.C. millivoltmeter to pin 3 of Skt1. Adjust screw 107a for maximum meter deflection. The screw should then be sealed with locking paint.

Adjusting Coil L1 (Only on Replacement): Set recorder to "Manual" Record, with volume/mod. level control at maximum. Apply a 1kHz signal to pin 1 Skt1 at such an amplitude that the voltage at pin 6 of Skt 1, measured with an a.c. millivoltmeter, is 0·77mV. Maintaining a constant input voltage, increase the input signal frequency to 14kHz and adjust L1 so that the voltage on pin 6 of Skt1 is 3·5mV.

Overall Frequency Response: Apply a 1kHz signal, via a 1MΩ resistor, to pin 6 of Skt1 at a level of 0·77mV. Keeping this input voltage constant, record some frequencies between 80 and 1,4000Hz, with the volume and tone controls at maximum. When played back, the output voltages, measured with an A.C. millivoltmeter at pin 3 of Skt1, should not differ by more than 6dB. If necessary to obtain the required response adjust the recording bias current (within the specified limits) with R531, see below.

Checking the Recording-Level Indicator: Switch to "Record" (Manual) and turn volume/mod. level control to maximum. Apply a 1kHz signal, via a 1MΩ resistor, to pin 1 of Skt1, at such a level that a voltage of 4mV, measured with an A.C. millivoltmeter, is obtained at pin 6 of Skt1. The pointer of the recording-level indicator should then be on the line (±1·5mm) between the red and black segments of the scale.

Recording Bias Current Adjustment: The recording bias current in K1 is determined by the setting of R531 and should normally be between 0·7 and 1·6mA; this may be measured as a voltage of 15–35mV at pin 6 of Skt1. Further adjustment of R531 may be made, if necessary, after carrying out "Overall frequency response" check in paragraph above. Reducing the bias current will increase the treble response; conversely, increasing the bias current will reduce the treble response. Should the bias current be below the lower limit specified, it will cause distortion at high modulation levels; if above the upper limit, it will result in poor treble response. If, after adjustment, the bias current is outside the range specified above, a defect in the record/playback head or the amplifier circuitry should be suspected.

PHILIPS Model N4307/55

General Description: Model N4307/55 is similar to the Philips Model N4307, described in the 1970–71 volume, except for the following variations:

Combined Motor/Mains Transformer: A combined motor/mains transformer is fitted instead of a separate motor and mains transformer. This combined motor/mains transformer is used for driving the tape transport and