



INSTRUCTION MANUAL
PROFESSIONAL TURNTABLES
TYPES 12D/3, 12D/4

Commonwealth Electronics Pty. Limited

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HOBART, TASMANIA

A PHILIPS COMPANY

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SECTION 1

GENERAL DESCRIPTION.

APPLICATION

1.1

The type 12D/3 and 12D/4 three and four speed turntables have been designed to meet the rigid specification demanded by professional users of microgroove and stereo recordings. The machines are designed and built to maintain their performance for very long periods of continuous use.

1.2 SPECIFICATION

Turntable diameter 12"

Turntable weight 6.5 lbs.

Speeds 12D/3, 33.33, 45.11, 77.93 RPM

" 12D/4, 16.66, 33.33, 45.11, 77.93 RPM

Speed tolerance 0% to + .25%

Wow and flutter Less than .1% RMS total at
33 RPM

Rumble Better than -50 db below recorded level
of 7 cm/sec at 1 Kc. RIAA playback curve.

Acceleration Less than $\frac{1}{2}$ revolution at 16.33,
33.33 and 45 RPM, $\frac{3}{4}$ revolution at 78 RPM.

1.3 GENERAL DESCRIPTION

The machine is of the internal rim drive type using a heavy duty 4 pole synchronous motor and heavy rimmed aluminium turntable. The coupling between the motor capstan and turntable rim is by large wide faced moulded neoprene idler wheel.

This wheel is controlled by a simple system of nylon cams enabling any speed to be selected instantly. A microswitch attached to the idler mechanism switches power

to the motor only when the idler wheel is in the operating position. When the speed selector is in any "neutral" position the idler wheel is disengaged and the motor switched off.

1.4 DETAILED DESCRIPTION

The following description should be read in conjunction with Drawing No. 12-200 showing the general assembly.

The frame (10) is an aluminium casting machined all over and providing support for all individual parts of the machine.

The turntable assembly (TA) consists of the turntable casting (11) machined, balanced and fitted by Morse taper to the lapped steel turntable spindle (12).

The turntable is also fitted with a damping ring (13), felt or rubber mat covering (14) and label (15).

The turntable assembly runs in a white metal lined bearing housing (16), end thrust is taken by thrust ball (17), seated in the end of the turntable spindle, and ball (18), fitted in the thrust block (19). Adjustment of the turntable height is provided by the screwed plug (20), and locknut (21).

The thrust block is secured to the bearing housing by three screws (22); the bearing housing is fastened to the frame by three screws (23), and spring washers (24).

The idler wheel (25) fits on sub-assembly (1A), consisting of a ground and lapped steel pin (26); thrust is taken by a "Tufnol" thrust washer (27) and thin steel washer (28). The idler wheel is secured by a circlip (29) at the top of the pin.

The idler pin is riveted to a brass link (30) which is in turn riveted to a steel pin (31) swivelling in a reamed hole in the end of the idler arm (32).

1.4 DETAILED DESCRIPTION (continued)

The idler pin assembly is secured in the idler arm by circlip (33). This circlip is also used to secure the solenoid armature push rod (97) when this assembly is fitted. A thrust washer (34) is fitted between the link (30) and idler arm (32). Speed selection is achieved by movement of the idler arm via the cam mechanism contained in the cam bracket sub-assembly (CA). This sub-assembly is secured to the underside of the frame by two screws (36) and spring washers (37).

The following components are contained in the sub-assembly: Cast housing (35), Speed control knob (38), Speed designation plate (39), Control knob thrust washer (40), Cam shaft (41), Cam shaft circlip (42), Cam assembly (43), Cam assembly grub screws (44), Idler arm shaft (45), Cam follower plate (46), Follower plate roller (47), Follower plate roller pivot (48), Follower plate roller pivot securing screw (49), Idler arm roller (50), Idler arm roller pivot screw (51), Idler arm tension spring (52), Idler arm tension spring upper anchor lug (53), screw (54), and lower anchor (55), Cam follower plate tension spring (56), and spring anchor (57), Microswitch (58), Microswitch roller actuator (59), Microswitch cover (60), Microswitch spacers (61), and microswitch securing screws (62), Idler arm shaft securing screw (63), Cam follower plate thrust washer (65), Speed designation plate securing screws (64). (not shown).

The operation of the speed selection system is as follows. Rotation of the cam assembly (43) imparts vertical motion to the idler arm via roller (50); this vertical motion allows the idler wheel to line up with the required step on the stepped motor pulley (65). Positive indexing of the control knob (38) is provided by the cam follower plate (46) and roller (47) together with tension spring (56); at the same time lateral movement of the idler arm and consequent engagement of the idler wheel is provided by the cam follower plate via the microswitch (58) and actuator (59) which are carried on the idler arm itself. This positively prevents application of power to the motor until the idler wheel is in contact with the stepped

1.4 DETAILED DESCRIPTION (continued)

pulley and turntable rim and ensures that the idler is withdrawn when the control knob is in any neutral position.

The synchronous drive motor (66) is fastened to the frame via the shockmount sub-assembly (SA), consisting of a casting (67), which is secured to the frame by screws (68) and spring washers (69) (not visible in drawing). Four moulded neoprene anti-vibration mounts (70), located in wells in the shockmount assembly casting support the motor via special nuts (71) and washers (72). The motor is fitted with four threaded spacers (73) which are securely held to the frame by transit screws (74) during transit and must be removed before use.

Motor end thrust and capstan height are taken by an adjustable thrust plug (75) and locknut (76) at the base of the motor. Oil pipes (77) enable the felt oil retainers to be replenished without removing the motor.

The electrical components, motor condenser, fuse etc. are protected by cover (78), secured by screws (79); a similar cover (101) is fitted over the solenoid power supply when this accessory is fitted.

SECTION 2.

INSTALLATION

A paper template is provided from which the correct cut-out can be made in the desk or motorboard.

The solid line on the template should be marked through by pricking with a scribe or other sharp instrument and cut out accurately.

The frame of the machine is drilled $13/64$ " for the wood screws provided, or $3/16$ " Whitworth or 2 BA metal thread screws if preferred.

Electrical connections to the unit are brought out on a short length of 3 core flex with standard 3 pin plug fitted. The earth pin of the plug is wired to the machine frame and should be used for earthing the unit.

During shipment the turntable is lowered into the surround to prevent damage: the transit screws (74) marked red are fitted to prevent damage to the motor antivibration mount; also the idler arm will be found tied back to prevent accidental engagement of the idler during shipment.

Before use adjust the turntable height as per 5.1, remove transit screws completely and release the idler arm.

The machine is supplied lubricated ready for use.

It is recommended that good practice be followed when mounting the machine: a heavy and rigid motor board should always be used and the very best results are obtained by mounting the turntable and pickup on a steel plate of approx. $1/4$ " thickness. The extra mass of the steel plate helps to suppress low frequency disturbance from all sources as well as providing extra shielding between the motor and pickup.

It is strongly recommended that no "mains" switch be provided but that the internal microswitch be used as such, this will reduce the possibility of leaving the idler

INSTALLATION (continued)

"in gear" with the mains off, thus avoiding "flats" on the tyre.

This instruction does not apply if the machine is fitted with solenoid idler operation accessory kit Type SK; in this case the idler wheel cannot remain "in gear" even if the power fails or is switched off.

SECTION 3.

OPERATION

Any of the usual methods of starting or cueing discs may be employed. DO NOT ATTEMPT TO STOP THE TURNTABLE - Stop the record by light pressure at the edge. The turntable will continue to revolve under the record without damage to the idler wheel tyre; an instant start will be obtained when the record is released.

NOTE THIS ONLY APPLIES TO FELT COVERED TURNTABLES.

The speed required may be selected by rotation of the speed control to the desired speed; the motor is then energised via the internal microswitch and the turntable starts. Selection of any of the four "N" (Neutral) positions releases the idler wheel and stops the motor.

SECTION 4

MAINTENANCE.

4.1 LUBRICATION

The drive motor should be lubricated via the oil pipes (77) at intervals of approximately 250 hours. Three or four drops in each pipe is sufficient, over-oiling should be avoided.

The turntable main shaft should be smeared with a few drops of oil at the same time as the motor is lubricated.

The idler wheel is fitted with a self lubricating bushing but a spot of oil should be applied to the bushing when lubricating the motor. Remove all surplus oil as any finding its way to the idler tyre will prevent operation of the turntable.

The speed control shaft (41), cam rollers (47 & 50), and idler arm shaft (45) should also be given a spot of oil when needed.

NOTE: IT IS IMPERATIVE THAT THE TURNTABLE MAIN SHAFT IS KEPT FREE OF DIRT WHEN REMOVED FROM THE BEARING. Any dirt introduced will cause stiffness of the shaft in the bearing, with consequent damage.

Loss of speed and excessive "wow" will also occur. An indication of the condition of the bearing may be obtained by allowing the turntable to "coast" to rest from 78 R.P.M. It should run for not less than 60 seconds.

All bearing surfaces including motor bearings, turntable main shaft and idler bearings are treated with molybdenum disulphide concentrate when assembled and it is strongly recommended that subsequent lubrication be with oil containing molybdenum disulphide.

4.1 LUBRICATION (continued)

A suitable lubricant is Rocol MOLIKIRON 4 obtainable from Rocol (Aus).Pty.Ltd. Should this oil not be available, a reputable brand of light machine oil may be used, but DO NOT use compounded motor oils.

CLEANING

The idler tyre and turntable will need cleaning occasionally. Use a cloth dampened with petrol or methylated spirit. DO NOT USE lacquer thinners or kerosene.

Keep the frame of the machine free of dust and dirt – felt covered turntables should be kept free of dust by means of a vacuum cleaner fitted with a suitable hose and fitting.

4.2 REMOVAL OR REPLACEMENT OF PARTS

4.2.1 TURNTABLE:TO REMOVE

Place speed control in "Neutral".

Fit turntable removing tool to record pin (slip tool over pin and push pin through the hole provided in the record pin). The turntable should now be carefully lifted clear of the bearing. Be careful not to put side pressure on the turntable as the shaft leaves the bearing.

Place turntable assembly on the bench with the spindle uppermost; this will prevent dirt being picked up by the spindle from the bench.

TURNTABLE:TO REPLACE

Reverse the above procedure.

WARNING

The speed control must be in "neutral" and the idler wheel moved away from the rim of the turntable. Failure to do this may result in the edge of the turntable striking the idler tyre as the turntable is lowered into position.

4.2 REMOVAL OR REPLACEMENT OF PARTS (continued)

Damage is almost certain if this occurs.

The turntable spindle and bearing must be clean before refitting.

4.2.2 IDLER WHEEL

To remove. Pull off circlip from top of idler shaft—remove wheel — see that Tufnol thrust washer remains on the shaft and is not lost.

To replace. See that wheel bearing is clean, smear shaft with oil and replace wheel and circlip.

4.2.3. MICROSWITCH

To remove. Take out the two screws securing the switch to the idler arm; the switch complete with roller and wiring cover may then be withdrawn.

To replace. Connect wires to new switch and reverse above procedure. Check that wiring lugs are clear of frame.

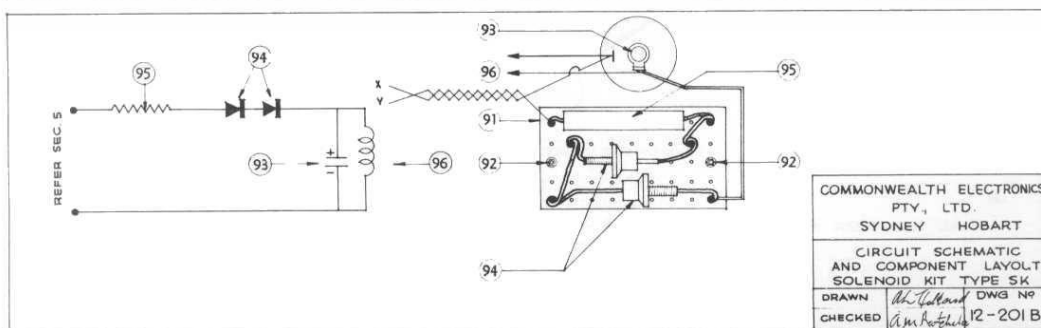
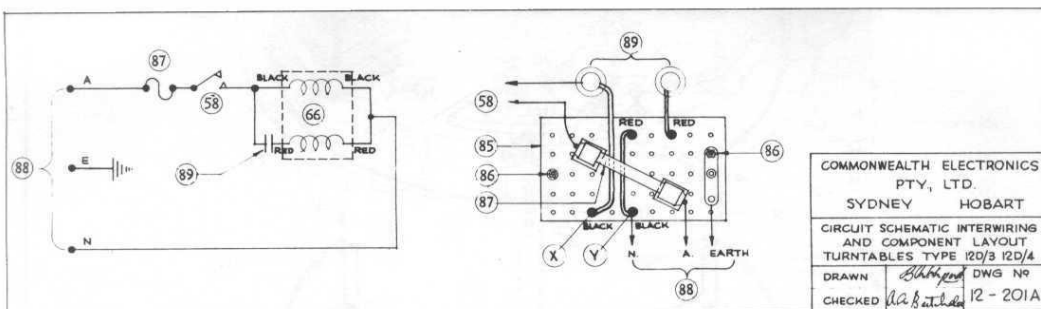
4.2.4. DRIVE MOTOR

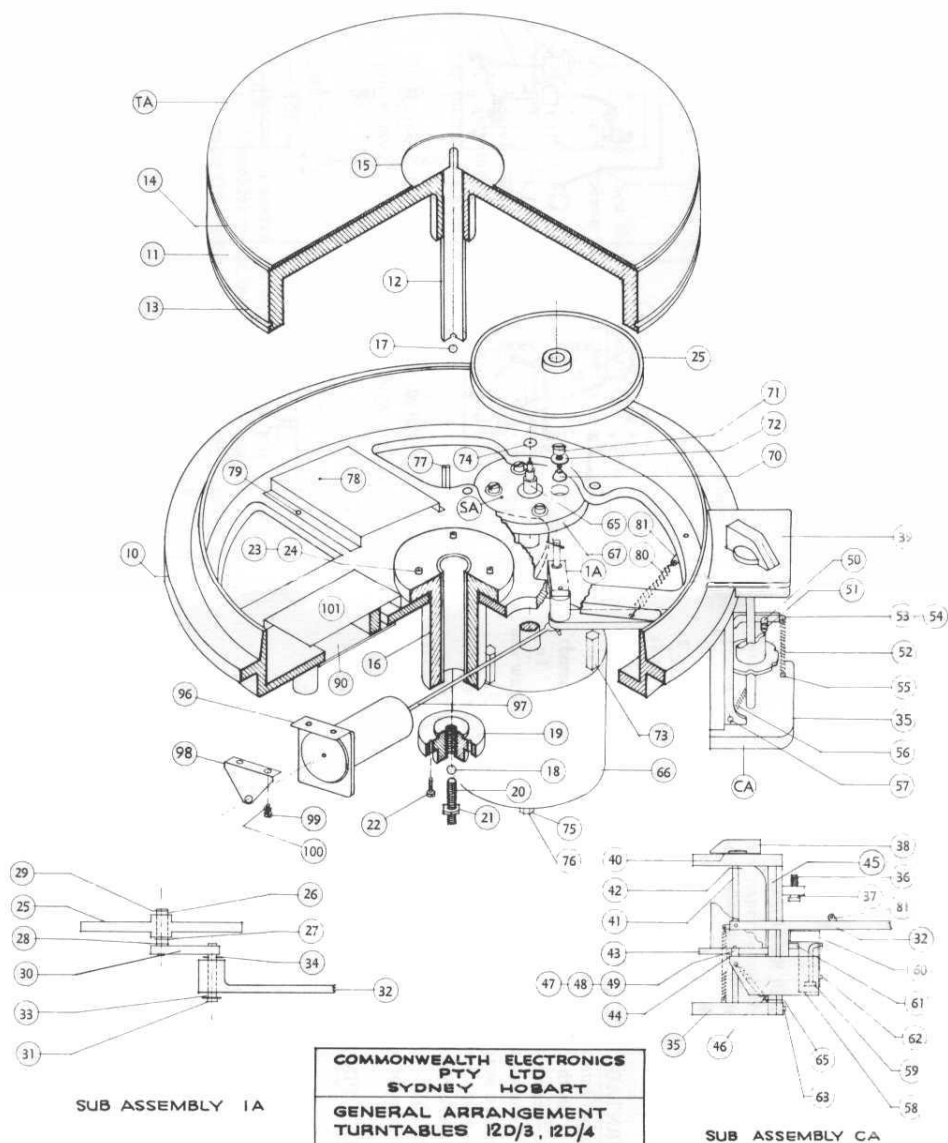
To remove. Remove the turntable idler wheel and cover plate (78). Unsolder motor leads from lugs on fuse board. Withdraw leads from grommet nuts. Unscrew special nuts (71) and lower the motor carefully downwards.

To replace. Reverse the above.

4.2.5. MOTOR ANTI-VIBRATION MOUNTS

To replace. Remove special nuts (71) and washers (72) one at a time, lift out old mount and replace with new one and refit nut and washer.





COMMONWEALTH ELECTRONICS
PTY LTD
SYDNEY HOBART

GENERAL ARRANGEMENT
TURNABLES 12D/3, 12D/4

DRAWN	G.R. Hughes	DWG. NO.	12-200
CHECKED	A.M. Butler		

4.2 REMOVAL OR REPLACEMENT OF PARTS (continued)

4.2.6 . CAM ASSEMBLY

To remove. In the event of damage to the nylon cams, the assembly may be removed as follows :

Loosen grub screws in boss under the cam assembly.

Remove circlip (42) from the cam shaft and withdraw the shaft complete with the speed control knob.

To replace. Reverse the above procedure.

4.2.7 TURNTABLE BEARING

In the event of wear or damage to the white metal lining a pre-reamed factory replacement can be supplied. To remove. Remove turntable, take out screws (23), withdraw old bearing, remove screws (22) and take off thrust block (19). Thoroughly clean new bearing, fit thrust plug and replace the assembly in the machine. Lubricate with few drops of oil, replace turntable. Check bearing as per section 4.1 after allowing to run for a few hours to settle down.

4.2.8 IDLER PIN ASSEMBLY

To remove . Remove idler wheel as per 4.2.2. remove clip (33) at bottom end of idler swivel pin (31) and withdraw the assembly from the idler arm. In the event of damage or wear the assembly must be replaced as a unit.

4.2.9. SPRINGS

The springs (52), (56), (80), may be removed by unhooking them from the lugs at each end. In the event of damage or breakage they should be replaced with new ones.

4.2.10 CAPSTAN

The capstan is attached to the motor shaft by Morse taper and a thread at the end of the shaft.

4.2.10. CAPSTAN

It is recommended that it be not disturbed unless absolutely necessary.

To remove. Remove motor from machine.

Hold motor shaft with pliers below capstan, wrap piece of fine emery paper round shaft before applying pliers. Unscrew capstan with second pair of pliers on

lower portion of capstan using emery paper as protection.

WARNING. Do not grip the capstan step on which the idler wheel runs – any damage here will affect the operation of the machine and damage the idler wheel.

To replace. Clean the shaft and capstan bore thoroughly, oil shaft and replace.

SECTION 5.

ADJUSTMENTS.

5.1. TURNTABLE HEIGHT

The turntable height is controlled by the screwed plug (20) and locknut (21). To adjust. Loosen lock nut (21) and unscrew (20) until turntable just touches frame. Turn screw clockwise approx. $\frac{1}{2}$ turn and tighten locknut.

5.2 CAPSTAN HEIGHT

The capstan height is controlled by the screwed plug (75) and locknut (76) at the base of the drive motor. To adjust. Remove turntable, place speed control in "45" position and adjust capstan height until idler wheel is centred on the capstan step, then tighten locknut. Check adjustment at "33" and "16" positions also. It is most important that the side of the idler tyre does not rub on the capstan steps.

5.3 IDLER WHEEL PRESSURE

This is set correctly at the factory and should be 150/200 grams measured at the end of the idler arm when in "45" speed.

5.4 MICROSWITCH.

To adjust. The microswitch (58) is actuated by cam follower plate (46) and microswitch roller actuator (59).

The cam follower plate is adjusted by bending so that when each speed is engaged the roller is just clear of the plate. It is unlikely this will need adjustment except in cases of damage to the cam follower plate.

SECTION 6.

6.1 ACCESSORIES.

SOLENOID IDLER ENGAGEMENT KIT. TYPE SK.

This kit is recommended in professional application where it is likely the turntable may be left in gear for long periods without power or where discs are pre-cued and started later by applying power to the motor. The operation is very simple; the normal idler tension spring is replaced by a Solenoid and associated rectifier wired across the motor. Application of power to the motor energises the solenoid which simultaneously engages the idler wheel and a perfectly smooth start results.

Immediately the power is removed the idler wheel retracts and "flats" on the idler are impossible. This feature combined with the deeply recessed turntable provides a maximum amount of protection against damage by incorrect operation.

6.2 INSTALLATION OF SOLENOID KIT. (Refer to Drawing No. 12-201B)

(a) Secure component plate in cut out in machine frame by means of screws provided. Electrolytic capacitor should be nearest turntable bearing.

(b) Remove idler tension spring (80).

(c) Remove circlip (33) at bottom of the idler swivel pin (31).

(d) Secure solenoid with screws provided and fit end of solenoid push rod over bottom end of idler swivel pin (31) and replace circlip (33).

(e) Pass leads from component plate through grommet in original component plate (83) and solder to lugs X Y Drawing No. 12-201A.

SECTION 6 (Continued).

6. 2 INSTALLATION OF SOLENOID KIT.

(f) Check D C voltage at solenoid terminals if desired; voltage should be approximately 245.

6.3 MOTOR SCREEN KIT TYPE MS.

For applications involving low level magnetic pickups which may be subject to hum pickup from stray fields, mumetal screen Kit type MS may be fitted to the motor.

6.4 To Fit.

Remove motor from machine.

Remove transit spacers (73) and fit the dished screen over the tie bolts and refit the spacers. Tighten evenly.

Fit disc type screen over motor mounting bolts and refit to the machine as per 4.2. 4.

6. 5 Cueing Plate Type C.P. may be fitted over felt topped turntables for maximum protection of original lacquer recordings by dust which may be present in the felt top.

SECTION 7.

TROUBLE FINDING CHART.

G E N E R A L.

<u>FAULT.</u>	<u>CAUSE.</u>	<u>REMEDY.</u>
TURNTABLE DOES NOT RUN	Blown fuse	Replace
	Faulty motor	Repair or replace
	Faulty microswitch	Replace
	Faulty wiring	Repair
	Turntable too low in surround.	Adjust end thrust (5.1)
	Oil on idler tyre.	Clean (4.1)
	Idler tension spring broken or weak.	Replace
	Idler Solenoid (if fitted) not working.	See Section 6.
	Turntable spindle corroded or jammed in bearing.	Clean or replace and relubricate.
	Idler wheel jammed on pin.	Clean or replace and relubricate.
	Idler link pin (31) tight in idler arm (32)	Clean and relubricate.
	Cam follower plate (46) bent.	Straighten and adjust as per 5.4.
	Low line voltage.	Adjust.
TURNTABLE RUNS BELOW CORRECT SPEEDS.	Faulty motor	Repair or replace.
	Dirty or greasy idler wheel.	Clean (4.1).
	Turntable spindle dirty, dry or damaged.	Clean and lubricate or replace.
	Idler wheel tight on pin.	Clean and lubricate or replace.
	Idler tension spring weak.	Replace (4.2.9)
	Idler Solenoid (if fitted) weak.	See Section 6.

SECTION 7 (Continued)

<u>FAULT</u>	<u>CAUSE</u>	<u>REMEDY</u>
TURNTABLE RUNS BELOW CORRECT SPEEDS.	Idler thrust washer (27) missing.	Replace.
	Idler link pin (31) tight in idler arm (32).	Clean and lubricate.
	Cam follower plate (46) bent.	Straighten and adjust as per 5.4.
TURNTABLE RUNS FAST.	Idler tyre rubbing on capstan step.	Check idler mechanism for damage or misalignment, adjust capstan height (5.2).
TURNTABLE " WOWS "	Low Line Voltage.	Adjust.
	Faulty motor	Repair or replace.
	Dirty or greasy idler wheel.	Clean (4.1).
	Damaged idler Wheel.	Replace.
	Cam follower plate bent.	Straighten and adjust as per 5.4.
	Idler tyre rubbing on capstan step.	Adjust capstan height (5.2).
	Dirt in turntable bearing.	Clean & relubricate (4.1).
	Turntable shaft damaged or white metal lining of bearing damaged.	Replace.
	Idler tension spring weak.	Replace (4.2.9).
	Idler bearing dirty.	Clean & relubricate.
	Idler thrust washer (27) missing.	Replace.

SECTION 8.

PARTS LIST.

To be used with Drawing No. 12 - 200

PART DESCRIPTION.	DRAWING IDENT.NO.	PART NO.
Turntable surround.	10	12/D - 10
Turntable.	11	12/D - 11
Turntable spindle.	12	12/D - 12
Turntable damping ring.	13	12/D - 13
Turntable felt.	14	12/D - 14F
Turntable rubber mat	14	12/D - 14R
Turntable label	15	12/D - 15
Bearing housing	16	12/D - 16
Turntable spindle ball	17	12/D - 17
Thrust ball bearing housing.	18	12/D - 18
Thrust block	19	12/D - 19
Thrust screw	20	12/D - 20
Thrust screw locknut	21	12/D - 21
Thrust block screws	22	12/D - 22
Bearing housing screws	23	12/D - 23
Bearing housing screw washers.	24	12/D - 24
Idler wheel.	25	12/D - 25
Idler pin sub-assembly.	26) 30) 31)	12/D - 1A
Idler thrust washer (Tufnol)	27	12/D - 27
Idler thrust washer (steel)	28	12/D - 28
Idler circlip.	29	12/D - 29
Idler arm.	32	12/D - 32
Idler pin sub-assembly circlip	33	12/D - 33

Section 8. (Continued).

PART DESCRIPTION	DRAWING IDENT. NO.	PART NO.
Idler pin sub-assembly thrust washer.	34	12/D - 34
Cam housing casting.	35	12/D - 35
Cam assembly attachment screws	36	12/D - 36
Cam assembly attachment spring washers.	37	12/D - 37
Speed control knob (bar type).	38	12/D - 38 B
Speed control knob (fluted type).	38	12/D - 38 F
Speed designation plate 4 speed.	39	12/D - 39 - 4
Speed designation plate 3 speed.	39	12/D - 39 - 3
Speed control knob thrust washer.	40	12/D - 40
Cam shaft.	41	12/D - 41
Cam shaft circlip.	42	12/D - 42
Cam assembly 4 speed.	43	12/D - 43 - 4
Cam assembly 3 speed.	43	12/D - 43 - 3
Cam assembly grub screws.	44	12/D - 44
Idler arm shaft.	45	12/D - 45
Cam follower plate	46	12/D - 46
Cam follower plate roller	47	12/D - 47
Cam follower plate roller pivot.	48	12/D - 48
Cam follower plate roller securing screw and nut.	49	12/D - 49
Idler arm roller.	50	12/D - 50
Idler arm roller pivot.	51	12/D - 51
Idler arm tension spring.	52	12/D - 52
Idler arm tension spring upper anchor.	53	12/D - 53

Section 8 (Continued).

PART DESCRIPTION	DRAWING IDENT.NO.	PART NO.
Idler arm tension spring screw.	54	12/D - 54
Idler arm tension spring lower anchor.	55	12/D - 55
Cam follower plate tension spring.	56	12/D - 56
Cam follower plate tension anchor.	57	12/D - 57
Microswitch	58	12/D - 58
Microswitch roller actuator.	59	12/D - 59
Microswitch cover.	60	12/D - 60
Microswitch spacers	61	12/D - 61
Microswitch securing screws and lock washers.	62	12/D - 62
Idler arm shaft securing screw	63	12/D - 63
Speed designation plate securing screws.	64 (not shown)	12/D - 64
Cam follower plate thrust washer.	65	12/D - 65
Drive motor	66	12/D - 66
Anti-vibration assembly casting.	67	12/D - 67
Anti-vibration assembly securing screws.	68 (not shown)	12/D - 68
Ditto spring washers.	69 (not shown)	12/D - 69
Anti-vibration mounts.	70	12/D - 70
Anti-vibration mount securing nuts.	71	12/D - 71
Ditto washers.	72	12/D - 72
Motor transit spacers.	73	12/D - 73
Motor transit screws	74	12/D - 74
Motor thrust plug	75	12/D - 75

Section 8 (Continued).

PART DESCRIPTION.	DRAWING IDENT. NO.	PART NO.
Motor lock-nut.	76	12/D - 76
Motor oil pipes.	77	12/D - 77
Component cover	78	12/D - 78
Ditto screws & lock washers	79	12/D - 79
Idler tension spring	80	12/D - 80
Idler tension spring anchors.	81	12/D - 81
Idler tension spring anchor screws	82 (not shown)	12/D - 82
Component base plate	83 (not shown)	12/D - 83
Ditto securing screws & washers.	84 (not shown)	12/D - 84
Component board.	85 Drg.No. 12-201A	12/D - 85
Ditto securing screws, nuts and washers.	86	12/D - 86
Fuse (1 amp).	87	12/D - 87
Power cord and plug.	88	12/D - 88
Condenser .5 MFD	89	12/D - 89
Component base plate.	90	12/D - 90 SK
Component board.	91 Drg. No. 12 - 201 B	12/D - 91 SK
Component board securing screws.	92	12/D - 92 SK
Filter condenser	93	12/D - 93 SK
Diodes OA210	94	12/D - 94 SK
Resistor 375 ohms.	95	12/D - 95 SK
Solenoid	96	12/D - 96 SK
Solenoid armature assembly	97	12/D - 97 SK
Solenoid rear stop assembly	98	12/D - 98 SK
Solenoid securing screws	99	12/D - 99 SK

Section 8 (Continued).

PART DESCRIPTION	DRAWING IDENT.NO.	PART NO.
Solenoid securing screw washers.	100	12/D - 100 SK
Solenoid component cover	101	12/D - 101 SK
Turntable Removing Tool	102	12/D - 102

30th APRIL, 1966

SUPPLEMENT TO INSTRUCTION MANUAL FOR
PROFESSIONAL TURNTABLE. TYPES 12D/3 and 12D/4.

The Types 12D/3 and 12D/4 turntables have now been in service for approximately 3 years and the following additional service information is offered as the result of experience gained over the past 3 years.

The most frequent complaint is a tendency for the machine to 'wow' and to run slightly below speed. This is nearly always due to the motor not reaching synchronous speed. The trouble may be easily diagnosed by placing the hand on the motor. If it is running in 'sync' a slight even vibration will be felt. If it is 'out of sync' a rhythmic change of vibration will be felt usually at a frequency of about one cycle per second. This trouble is caused by three faults (1) Tight Bearings (2) Faulty stator winding (3) 'Gummed' bearings caused by use of incorrect lubricant. Of the three, (1) is the most likely. This fault is caused by the porous bronze bearings closing slightly after the turntable is tested at the factory - it is also caused by the stator stack settling slightly and causing misalignment of the bearings and consequent stiffness of the shaft.

This latter fault can be corrected by giving the motor a few sharp taps around the area of the bottom bearing. (A suitable object being the plastic handle of a large screwdriver). This tapping has the effect of jarring the bearings into perfect alignment and the motor will then run in 'sync'. If this treatment is not effective a long period of 'running in' may cure the trouble but obstinate cases need attention to the bearings and it is strongly recommended that the motor be removed and returned to the Hobart factory for correction under guarantee.

If a motor which has free bearings and normally runs correctly suddenly runs out of 'sync', it is most likely a winding fault in the stator or it could be lack of lubrication or 'gumming' of the bearings due to the use of an unsuitable lubricant.

A motor with bearings in good condition should continue to spin after the power is switched off for 10 seconds or longer (this is with the motor warm).

The thrust bearing at the bottom of the motor has not proved troublesome but occasionally the ball has been lost or has not been seated in the end of the shaft correctly. This latter condition is immediately apparent because of excessive noise and vibration, and the capstan will be abnormally high and will not line up with the idler wheel correctly.

Before leaving the motor, we strongly recommend that only the ROCOL Molykiron SAE 5 oil be used - some household and sewing machine oils tend to become 'gummy' and trouble will eventually occur.

In some cases, the idler wheel will not clear the capstan and turntable, when the speed selector is in the 'Neutral' positions - this is caused by excessive clearance between the microswitch roller actuator (59) and the cam follower plate (46) Section S.4. For 12D/3 machines, the plate should just contact the roller at 33 R.P.M. and for 12D/4 machines, the same applies at 16 R.P.M.

The cam follower plate is of aluminium and may be easily bent by hand to correct the clearance. In some cases the adjustment has been upset by rough treatment in transport and it should be checked when the machine goes into service.

On machines fitted with solenoid kits, the clearance between the solenoid armature plate and the bush in the end of the solenoid housing should be $1/32$ " - $1/16$ " when in 33 R.P.M. for 12D/3 or 16 R.P.M. for 12D/4. The adjustment is made by the screwed joint between the armature and push rod. This joint with lock nut is inside the solenoid coil and is not accessible until the solenoid is removed from the machine and the armature withdrawn - The locknut should be loosened and the assembly replaced on the machine, the clearance can now

be set by revolving the armature disc, then remove the assembly, tighten the locknut and replace finally.

The armature rear stop plate (98) has been known to become bent. It should be approximately perpendicular to the machine frame. When the machine is put in 'Neutral' the armature disc should just contact the rubber buffer in the bracket. Heavy contact may mean the bracket is bent inward or insufficient clearance is present at the microswitch roller. (Section S4). When the idler wheel is removed great care should be taken that the Teflon thrust washer is not lost. Loss of this part will upset the idler alignment and may cause the tyre to rub on the capstan step with consequent 'wow'.

The thrust ball (18) in the bottom end of the turntable shaft can become dislodged from its seating - this will cause the turntable to run at an abnormal height above the surround and will cause noise and rumble - the ball should always be secured with a little grease.

The solenoid armature and push rod must be quite free at all times - any binding within the solenoid coil or at the point of attachment to the idler swivel pin must be avoided. Binding in the solenoid is caused by a bent push rod or bent solenoid mounting bracket - both may be corrected by bending.