

'diamond-dot'

CAR RADIO DIVISION, ELECTRONIC INDUSTRIES LTD.

ASTOR HOUSE: 161-173 STURT STREET, SOUTH MELBOURNE Phone: 69 0300

T3B - 1

File - TAPE UNITS

Date - 30.11.1967.

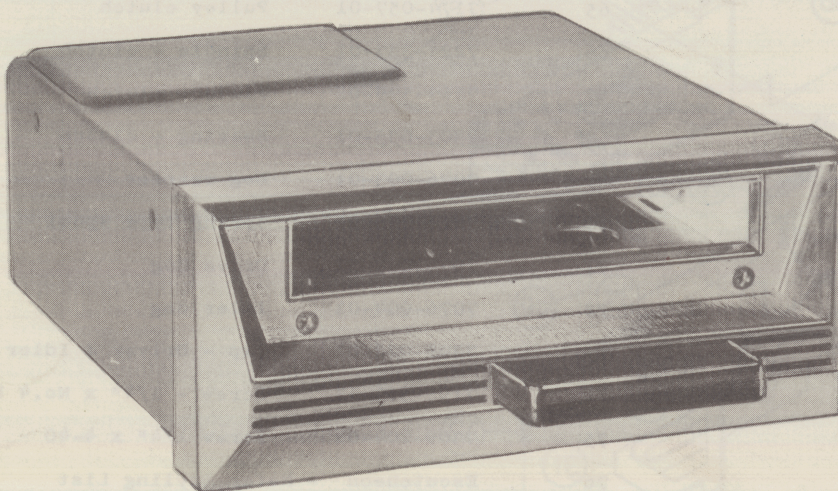
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SERVICE DATA

MODEL "T3B"

TAPE PLAYER UNIT

FOR OPERATION WITH A 12 VOLT CAR RADIO RECEIVER



This Cassette type tape player unit is designed for connection by a cable to one of the following model Car Radio Receivers.

PD-C12J	-	MD-C12J	-	PD-C14J
MD-C14J	-	PN-C12N	-	MN-C12N
PN-C14N	-	MN-C14N	-	PN-C12Q

Pins on the circuit boards of these receivers accept the socket attached to Tape Player interconnecting cable.

The Tape Player Unit may be operated with 12 Volt Car Radio Receivers produced prior to those listed above.

The cable connections will have to be tailored to suit the particular model Receiver circuitry.

Details of typical connections are contained in these Data Sheets.

CHASSIS SERIAL NUMBER

The number is visible through a slot in the rear of the unit can.

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AUDIO AMPLIFIER MODULECAPACITORS PART NO.4067-006-01

Circuit No.	Value	Description	Tol ±	Rating D.C.W.	Part Number
1	2.5uF	Electrolytic	+50% -10%	64	4005-035-02
2	125uF	Electrolytic	+50% -10%	16	4005-027-03
3	2.5uF	Electrolytic	+50% -10%	64	4005-035-02
4	16uF	Electrolytic	+50% -10%	10	4005-009-13
5	.015uF	Polyester	+ -10%	250	4009-018-04
6	80uF	Electrolytic	+50% -10%	2.5	4005-030-05
7	10uF	Electrolytic	+50% -10%	16	4005-007-08
8	10uF	Electrolytic	+50% -10%	16	4005-007-08
9	.002uF	Polystyrene	+ -10%	50	4004-003-06

RESISTORS

Circuit No	Ohms	Description	Tol ±	Rating Watts	Part Number
11	100K	Carbon	10%	1/2	4022-013-02
12	220K	Carbon	10%	1/2	4022-063-01
13	47K	Carbon	10%	1/2	4022-051-03
14	560K	Carbon	10%	1/2	4022-010-01
15	22K	Carbon	10%	1/2	4022-026-02
16	33K	Carbon	10%	1/2	4022-059-03
17	270K	Carbon	10%	1/2	4022-071-01
18	100K	Carbon	10%	1/2	4022-013-02
19	10K	Carbon	10%	1/2	4022-004-01
20					
21	6.8K	Carbon	10%	1/2	4022-002-02
22	100K	Carbon	10%	1/2	4022-013-02
23	3.9K	Carbon	10%	1/2	4022-020-01
24	560K	Carbon	10%	1/2	4022-010-01
25	33K	Carbon	10%	1/2	4022-059-03
26	270K	Carbon	10%	1/2	4022-019-01
27	10K	Potentiometer			4025-003-04
28					
29					

MISCELLANEOUS

Circuit No	Description	Part Number
30		
31	Transistor Type AT337	4128-133-01
	or Transistor, type AT328	4128-126-01
32	Transistor, type AT327	4128-125-01
33	Transistor, type AT327	4128-125-01
34	Transistor, type AT321	4128-119-01
35	Switch, radio/tape change-over	4059-202-01
36	Transformer, output	4042-140-01

MOTOR CONTROL MODULE

This module is being serviced as a complete unit. No individual components are available as spares.

STYLING

	ASTOR	AIRCHIEF	B.M.C.	CHRYSLER
Escutcheon includes:	7084-297-01	7084-288-02	7084-297-01	7084-297-01
'Diamond dot'	7081-001-01	-	7081-001-01	7081-001-01
Badge	7008-385-01	7008-385-11	7008-385-21	7008-385-31

CONNECTING A TAPE PLAYER TO AN EARLY MODEL RECEIVER

The following procedure is to be used as a guide when connecting a tape player to a receiver produced prior to the models listed on Page 1.

1. Cut off the plug from the receiver end of the lead.
2. Make a suitable hole in the receiver can for the cable entry.
3. Strip the inner P.V.C. sleeve back.
4. Break the circuit between the RF audio output and the high side of the volume potentiometer and connect the ORANGE wire to the radio audio output.
5. Connect the YELLOW wire to the high side of the volume potentiometer.
6. Break the circuit between the RF stages and the supply line . Connect the RED wire to the positive supply line.
7. Connect the BLACK wire to the negative supply line.
8. Connect the WHITE wire to the receiver RF stage supply line.
9. Connect the inner audio braids to audio earth.
10. Attach the earth ring of the outer braid to the receiver can.

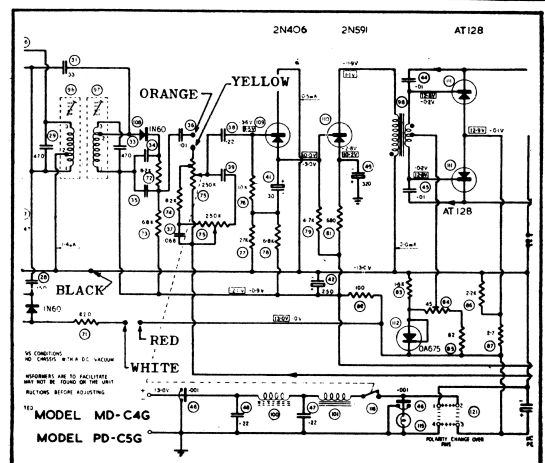
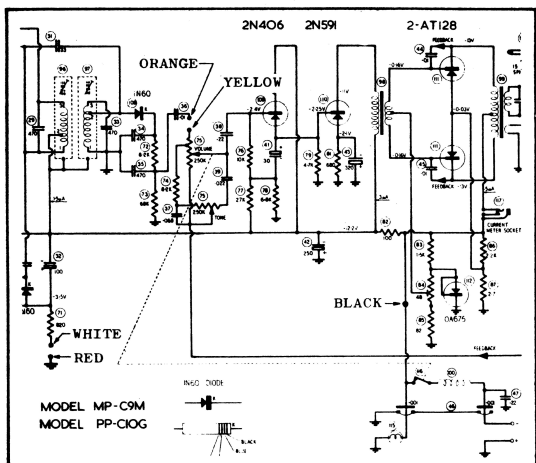
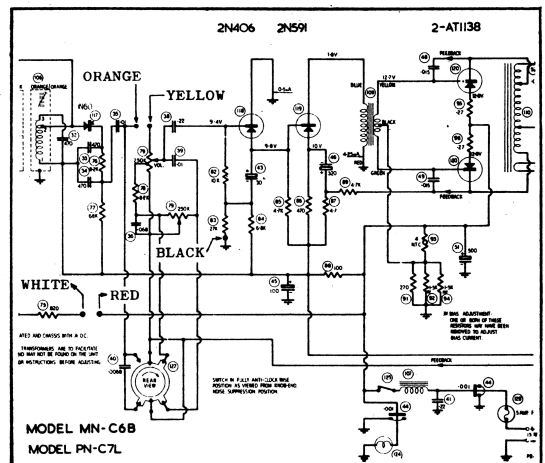
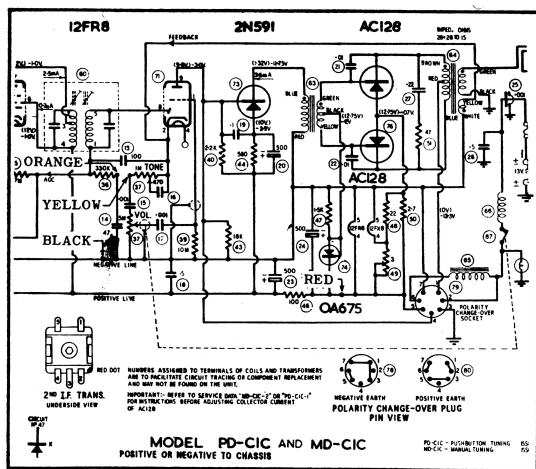
It may be necessary to cut the printed circuit to isolate the various audio and RF stages.

In some older model receivers it may be impractical to switch the receiver supply to the RF stages. In such cases switching of the audio only has proved satisfactory.

With this arrangement the red and black supply wires are connected to the appropriate supply points within the receiver and the white wire is not connected.

Check and observe correct polarity of connections.

TYPICAL CONNECTIONS TO RECEIVERS



AUDIO AMPLIFIER TEST

EQUIPMENT

Audio Generator - 600 ohms maximum output impedance
Output Meter - V.T.V.M. type

CONDITIONS

Supply Voltage - 13V D.C.
Current Drain - approx. 10mA
Voltage at Test Point 'C' - $10.6V \pm 1V$
Disconnect tape head then connect output from generator to amplifier board pins A and B.
Connect output meter to top end of level control, circuit No.27.
Set frequency of generator to 1KHz and the generator output to 0.6mV.

GAIN TEST

With the equipment connected as above the amplifier output level is to be between 0.8 and 1.25 volts.

OVERLOAD TEST (connections and conditions as for gain test)

Increase generator output until clipping occurs.
Output voltage level must be greater than 0.75V.

EQUALIZATION TEST (connections as for gain test)

Set frequency to 100Hz and generator output to 0.1mV.
Output voltage level is to be between 0.4 and 0.64 volts

Set frequency to 10KHz and generator output to 0.6mV.
Output voltage level is to be between 0.4 and 0.64 volts.

FINAL CHECK

Before fitting the unit into the can and re-installation into the vehicle, the tape player should be operated with its mating receiver.

Adjust the player output level control, circuit No.27 to obtain approx. the same output level when operating from radio or tape.

OPERATION OF UNIT

1. Insert cassette into opening until cassette is against stop inside unit.
2. Press push button of unit. This operation switches the unit 'ON' and connects the tape audio output to the radio receiver audio system.
3. To stop player and switch to "Radio" press push-button again to release mechanism.

SERVICE CASSETTES

Part Number	Description
4121-031-01	Speed Check and Azimuth Adjustment. Philips type 4822-218-001-99
4121-032-01	Mirror, pinch wheel adjustment Philips type 4822-397-3001
4121-033-01	Wow and Flutter, Gain test. Philips type HU71515

OPERATION OF RADIO RECEIVER WITH TAPE PLAYER REMOVED

A shorting plug Part No.7171-118-01 is available for use when a tape player is being serviced and the radio receiver is required to be left in operating condition.

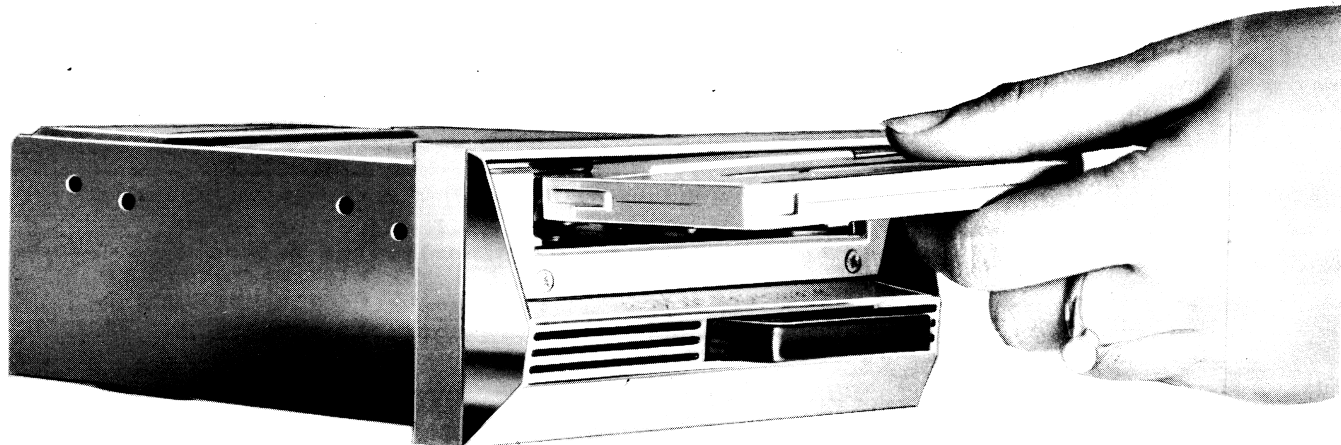
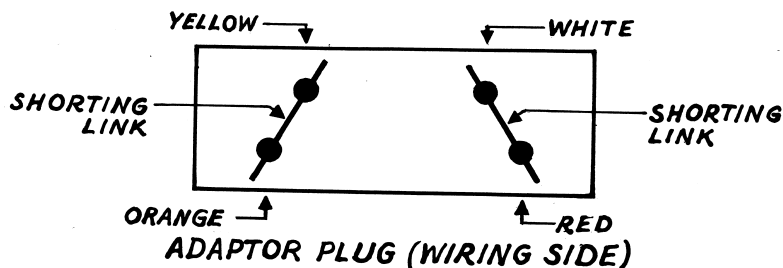
Remove the can from tape player and disconnect the cable plug.

Insert shorting plug into cable socket.

If ignition noise is excessive, shield the plug-socket assembly with a piece of large size tinned copper braid.

LEAD CONDUCTOR COLOURS

Audio: Orange
Yellow
Supply: Red +
Black -
White
Inner shield
Outer shield



SERVICE ADJUSTMENTS AND FAULT ANALYSIS

NOTE: When servicing the tape player unit it is important that the bench top be covered with a soft flexible material or alternatively that the unit main chassis be spaced up off the flat surface.

The reason for specifying these conditions is to prevent the end of clutch and flywheel bearing plate (61) from being hammered against the bench top during each test operation.

If the above precautions are not adhered to the lower bearing (62) of the clutch will be pressed upward and so cause the clutch to slip resulting in tape being spilled out of the cassette instead of being wound on to the hub.

1. CASSETTE RUNNERS

- Insert cassette and check that runners (8) and (28) are free and do not stick.
- Observe that the spring loaded rollers (9) grip the cassette.
- Pull back each corner of the cassette about 1/16" in turn and then let go. The spring loaded rollers should return the cassette to the 'in' position.

REMEDY: Check or replace springs (10). Adjust runners (8) and (28) then securely tighten screws (12).

2. SWING CHASSIS BEARING

- Check that button is in the 'OUT' position.
- Apply sideways pressure to the swing chassis each way while holding the main chassis.
- Visually check that there is not more than .020" sideways movement of the swing chassis at the point where the driving spindle protrudes.

REMEDY: Check that spring (44) and spacer (43) are set in position and that circlips (14) are securely attached to spindle (13).

3. CLEARANCE BETWEEN CAPSTAN AND CASSETTE

- Set button to 'OUT' position.
- Insert a cassette into the unit.
- Check that a .006 feeler gauge will pass easily between the bottom of the cassette and the top of the capstan.

REMEDY: Check that flywheel mount plate (61) and screws (74) are securely tightened. Check that correct thrust pad (60) is in position.

4. CASSETTE LOCATION

With a cassette in position and the button in the 'IN' position observe that the hub holes in the cassette are concentric with the drive dog (71) and idler dog (72).

REMEDY: Check swing chassis (84) location also refer Para. 2.

5. TRIP MECHANISM

- Insert a cassette into player unit.

9. PINCH WHEEL PRESSURE

- Connect player unit to receiver and switch 'ON'.
- Operate trip lever with fingers then push button 'IN'.
- Connect tension measuring device to the pinch wheel carrier (16).
- Increase gauge tension until pinch wheel ceases to revolve, indicating that it has lifted clear of the capstan.
- Tension gauge reading is to be between 250 gram min. and 300 grams max.

REMEDY: Adjustment of pressure is achieved by bending the tension spring lug 'D' on the chassis.

10. PINCH WHEEL ALIGNMENT

- Connect player unit to receiver and switch 'ON'.
- Insert 'mirror cassette' into unit then push button 'IN'.
- Observe carefully the tracking of the tape through the pinch wheel and capstan. If the tape tends to ride up or down off the capstan the alignment of the pinch wheel is at fault.

REMEDY: Open or close the adjustment gap 'E' in the rear of the pinch wheel carrier (16) until the tape runs smoothly between the pinch wheel and capstan.

11. ALIGNMENT OF MOTOR BELT

- Check by eye that the belt arrives on the motor pulley approximately at right angles to the motor shaft.

REMEDY: Loosen the two screws (50) fastening clamp bracket (48). Slide motor forward or backward to achieve alignment. Securely tighten the screws.

12. IDLER DOG SPINDLE

- Operate trip lever with fingers then push button 'IN'.
- Turn the idler dog with the fingers and check that it is free.
- An idler dog which does not turn freely must be replaced.

REMEDY: Prise off the cap (73) then lift dog (72) off dog carrier (69). Note that the spring (70) is in position and operating. Replace dog, check movement and refit cap. NOTE: The round end of dog is to be uppermost against cap.

13. ACTUATOR BAR - PINCH WHEEL CARRIER CLEARANCE

- Operate trip lever with fingers then push button 'IN'.
- Insert a .020" feeler gauge between the rear tag 'F' of pinch wheel carrier (16) and the protruding lug 'G' of actuator bar (20). Tolerance of -0" +.010" is allowable.

REMEDY: Bend tag 'F' on pinch wheel carrier to achieve tolerance.

14. MOTOR SPEED

5. TRIP MECHANISM
- Insert a cassette into player unit.
 - Note when the cassette reaches the full in position that the trip lever (27) has operated freeing the push button actuator plate (31).
 - Remove cassette and check that button is locked out and cannot be operated.

REMEDY: To adjust trip lever, bend end ' ' of lever nearest the cassette with long nosed pliers. Check that trip level does not present a sharp edge to cassette and the plastic sleeve (90) is in position.

6. ACTUATOR PLATE LATCH

- Insert a cassette into player unit.
- Operate push button (79) and note that latch plate (23) locks plate in the 'IN' position.
- Note that actuator bar (20) has moved across allowing the pinch wheel carrier (16) to press against tape.
- Check function by operating push button several times.

REMEDY: Check that springs (21), (24) and (19) are in position. Note the rear face of push button (79) is not fouled with foreign matter.

7. NON-RELEASE OF ACTUATOR PLATE

If the actuator plate does not return to 'OUT' position when the push button is pressed the following checks should be made.

- Note that springs (35), (45) and (34) are in position and operating.
- Check the formed ramp ' ' of latch plate (23) has not been altered and that it presents a smooth curved face to projection 'C' of actuator plate (31).
- Check adjustment of cam follower. Refer Para. 8.

8. CAM FOLLOWER HEIGHT ADJUSTMENT

- Operate trip lever with fingers then push button 'IN'.
- Turn adjusting screw (12) on the cam follower (37) until the dimples on the swing chassis are tight against the neoprene pads (85) on the main chassis.
- Press push button again. If adjusting screw has been tightened sufficiently, the button will not come out.
- Slowly turn adjusting screw anticlockwise until button releases.
- Check freedom of movement by operating button several times.
- Lock screw (12) with lacquer.

- REMEDY: Bend tag 'F' on pinch wheel carrier to achieve tolerance.
14. MOTOR SPEED
- Connect player unit to receiver and switch 'ON'.
 - Insert 'motor speed test cassette' into unit then push button 'IN'.
 - With the secondhand of a clock check that the 400Hz sound is heard every 98.1 seconds.

REMEDY: Adjust potentiometer circuit No. 21 of the motor module until tolerance is achieved.

15. CLUTCH TORQUE MEASUREMENT - refer NOTE preceeding Para. 1.

- Check that large diameter flange of bearing (62) is hard against top face of bearing mount plate (61) Correct before proceeding.
- Connect player unit to receiver and switch 'ON'.
- Operate trip lever with fingers then push button 'IN'.
- Connect torque gauge to drive dog (71) and check that the reading obtained is between 25 grams/cm. and 30 grams/cm.

REMEDY: Adjust to within range by removing circlip (54) and refitting to a higher notch to increase or a lower notch to decrease torque.

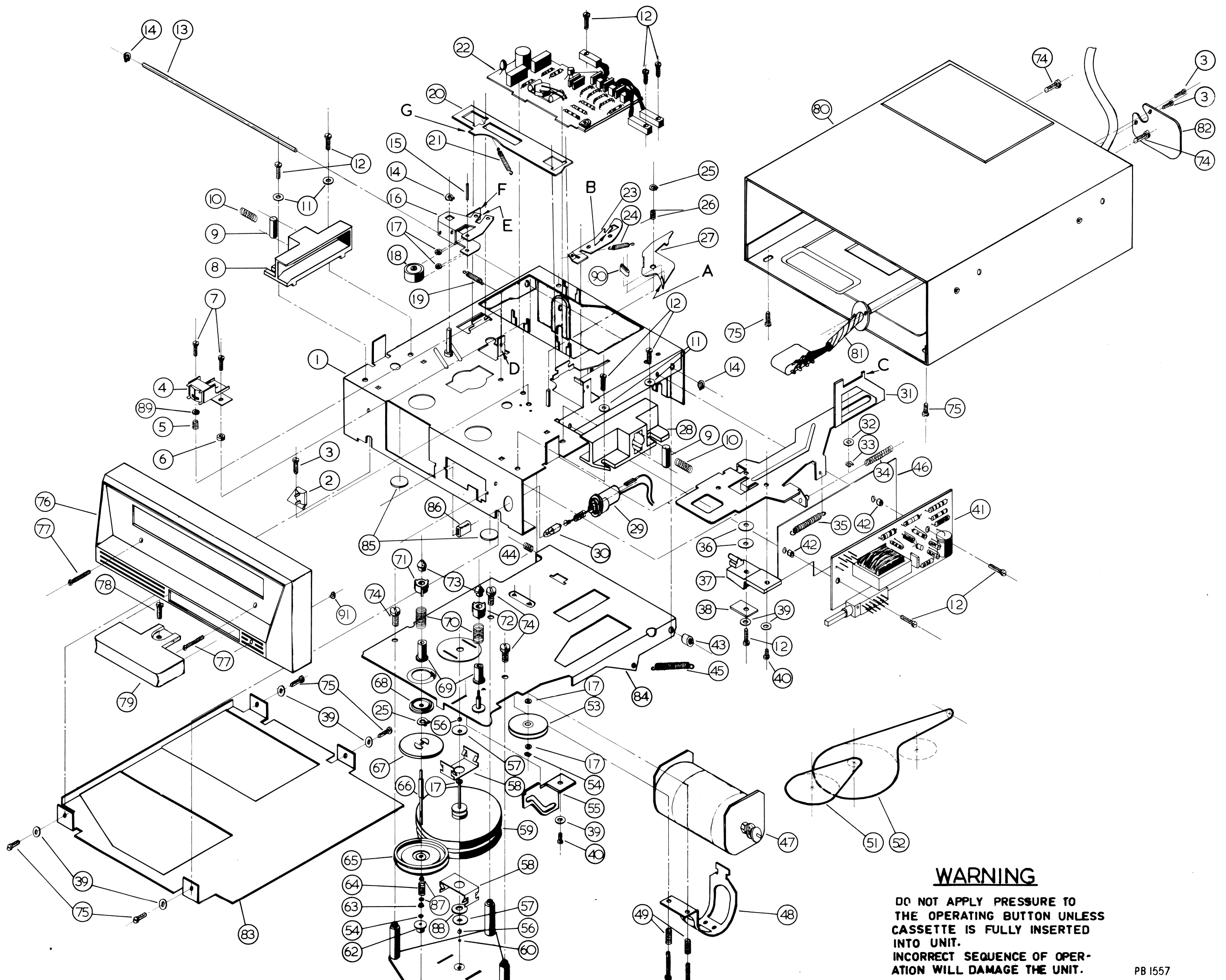
Check reading and note that circlip is securely located.

16. AZIMUTH ALIGNMENT OF TAPE HEAD

- This adjustment is to be performed whenever the tape head has been replaced or the adjusting and mounting screws (7) have been altered from their original settings.
- CAUTION: Do not place magnetized tools in close proximity to tape head.
- Connect player unit to receiver and switch 'ON'.
- Insert "azimuth" test cassette into player then push button 'IN'.
- Connect a high impedance A.C. voltmeter (1 volt range) to the output of player unit, i.e. moving arm of circuit No. 27.
- Check that screw (7) fastening head spacer (6) has been securely tightened then adjust other screw(7) fastening head mount until a maximum reading is obtained.
- Lock the mount screws with lacquer.

17. AUDIO OUTPUT LEVEL

- With player set up as for "AZIMUTH ADJUSTMENT" Para 16, proceed with a standard level tape cassette inserted into unit.
- Observe level indicated on voltmeter then adjust potentiometer circuit (27) to obtain a level of .5 volt.



WARNING

DO NOT APPLY PRESSURE TO THE OPERATING BUTTON UNLESS CASSETTE IS FULLY INSERTED INTO UNIT. INCORRECT SEQUENCE OF OPERATION WILL DAMAGE THE UNIT.

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION	ITEM.	PART NO.	DESCRIPTION
1.	7052-206-02	Main Chassis	33	7055-255-03	Circlip	63	7057-025-01	Stud - spring locator
2.	7108-022-01	Guide - Tape	34	7225-262-01	Spring - Act. Switch	64	7225-250-01	Spring - clutch
3.	7196-334-04	Screw - 3/16" x No.8	35	7225-247-01	Spring Act. Bar	65	7174-057-01	Pulley clutch
4.	4066-001-01	Tape Head	36	7261-538-01	Washer	66	7224-383-01	Spindle - clutch
5.	7225-257-01	Spring - Head	37	7108-021-01	Cam Guide	67	7169-599-01	Plate - clutch
6.	7293-014-02	Spacer - Head	38	7169-629-01	Plate - Cam	68	7303-035-01	Bearing - clutch
7.	7309-075-01	Screw 8mm x 2mm Ch.Hd.	39	7261-120-06	Washer	69	7076-003-01	Dog carrier
8.	7192-013-51	Runner - L.H.	40	7196-375-11	Screw	70	7225-246-01	Spring tape spool
9.	7189-020-02	Roller	41	4067-006-01	Module - Audio	71	7076-004-51	Drive Dog
10.	7225-243-01	Spring - Roller	42	7293-012-02	Spacer	72	7076-004-01	Idler dog
11.	7261-138-10	Washer	43	7293-018-07	Spacer - Chassis Locate	73	7308-022-01	Cap - Driver & Idler dogs
12.	7196-375-20	Screw - 5/16" x No.6 BA Ch.Hd.	44	7225-241-01	Spring - Chassis Locate	74	7196-367-11	Screw - 1/4" x No.4 brass
13.	7224-395-01	Spindle - Pivot	45	7225-248-01	Spring - swing chassis	75	7309-204-01	Screw 1/4" x 4-40
14.	7055-534-02	Circlip	46	7120-216-01	Insulator	76	Escutcheon - Refer Styling List	
15.	7303-038-01	Bearing - Pinch Wheel	47	4054-016-01	Motor	77	7198-626-17	Escutcheon screws
16.	7295-017-01	Carrier - Pinch Wheel	48	7054-116-01	Motor Bracket	78	7196-375-09	Screw 1/4" x No.6
17.	7261-105-01	Washers - Nylon	49	7225-240-01	Spring Motor Mount	79	7124-437-01	Knob - Push button
18.	7189-019-01	Roller - Pinch Wheel	50	7196-375-18	Screw - Motor Mount	80	7045-040-01	Cam assembly
19.	7225-245-01	Spring Wheel Pressure.	51	7017-008-01	Belt - Clutch	81	4078-025-01	Lead assembly
20.	7015-059-01	Actuator Bar	52	7017-009-01	Belt - drive	82	7065-259-02	Cover Plate
21.	7225-244-01	Spring - Head Actuator	53	7272-027-01	Wheel - Idler Pulley	83	7052-204-01	Chassis - brace
22.	4067-005-01	Motor Control Module	54	7055-255-02	Circlip	84	7052-209-01	Swing Chassis - assembly
23.	7015-060-02	Latch Plate	55	7043-017-01	Cam - Plate	85	7159-060-01	Pad
24	7225-242-01	Spring - Trip Bar	56	7303-034-01	Bearing self aligning	86	7228-033-01	Stop - chassis
25	7055-534-01	Circlip	57	7054-119-01	Clamp - self aligning bearing	87	7261-085-02	Washers
26	7225-239-01	Spring - Lock Plate	58	7054-114-01	Clamp - self aligning bearing	88	7261-232-02	Washer
27	7028-633-01	Lever - Trip	59	7272-024-03	Flywheel	89	7261-103-06	Washer - Head adjustment
28	7192-013-01	Runner - R.H.	60	7159-057-01	Thrust Pad	90	1104-050-99	Sleeve PVC 5mm
29	7222-143-01	Socket - Lamp	61	7027-575-01	Clutch & Flywheel bearing mount includes spacers	91	7032-001-03	Button
30	4068-003-06	Lamp	62	7308-023-01	Bearing - clutch bottom		7171-115-01	Socket, 7-Pin, part of 81
31	7169-606-01	Actuator Plate	63	7057-025-01	Stud - spring locator		7171-113-01	Socket, 5-Pin, part of 81
32	7261-163-08	Washer					1171-048-99	Cable - part of 81
							7171-118-01	Plug, 7-Pin, shorting.

INSTALLATION INSTRUCTIONS

The Player Unit has a mount cradle attached which is designed for mounting to the lower lip of instrument panel or parcel shelf.

A multi-hole metal strip is supplied for use as a rear support. This bracket may be cut or bent to provide a convenient means of support to the firewall or cross member, or to the receiver can.

1. Fasten bracket to one of the rear holes of cradle with flat washers, a shake-proof washer, a 3/8" x 3/16" Whit. screw and nut.
2. Select a position for mounting which will not interfere with the mechanical functions of existing equipment in the car. Check interconnecting cable to ensure that length is adequate for connection to receiver.
3. Mark the positions of the mount holes of cradle and rear brackets. Withdraw unit and drill 9/64" holes at cradle positions and a 9/32" hole at the rear bracket hole position.
4. Open the top lid of receiver and remove the jumper contacts from the circuit board pins.

NOTE 1: Models PD-C14J, MD-C14J, PN-C14N and MN-C14N only.

If the unit is being connected to one of these model receivers which have the circuit board coded 'CD75' the RED and WHITE leads on the interconnecting cable socket are to be interchanged.

Receivers fitted with circuit boards designated 'CD75A' require no modification to the cable.

NOTE 2: If the receiver was produced prior to the models listed on front page, use the circuits shown on page 6 of this data as a guide to connections.

Anchor the cable eyelet to receiver in a similar manner as described in Para.6.

5. Locate the connecting lead socket on to the pins then insert into the slot located near the battery lead entry point in the receiver can.
6. Locate hole in cable eyelet over hole in can then close lid of receiver. Fasten eyelet with a 1/4" x No.6 bdr.hd.screw. Securely tighten then fit all screws fastening lid to receiver.
7. Refit receiver to its mount position.
8. Reposition player unit. Fasten cradle with flat washers and 3/4" x No.8 bdr.hd.screws. Two 1" x 3/16" Whit. screws, washers and nuts are supplied as an alternative means of fastening.
9. Fasten rear bracket with a 1-1/4" x 1/4" Whit. Hex.hd.screw, flat washers, shakeproof washer and a 1/4" Whit. nut.
10. Securely tighten all mounting screws.

WARNING: Do not apply pressure to the operating button unless a cassette is inserted against stop inside unit.

Incorrect sequence of operation will damage the unit.

AT 32.

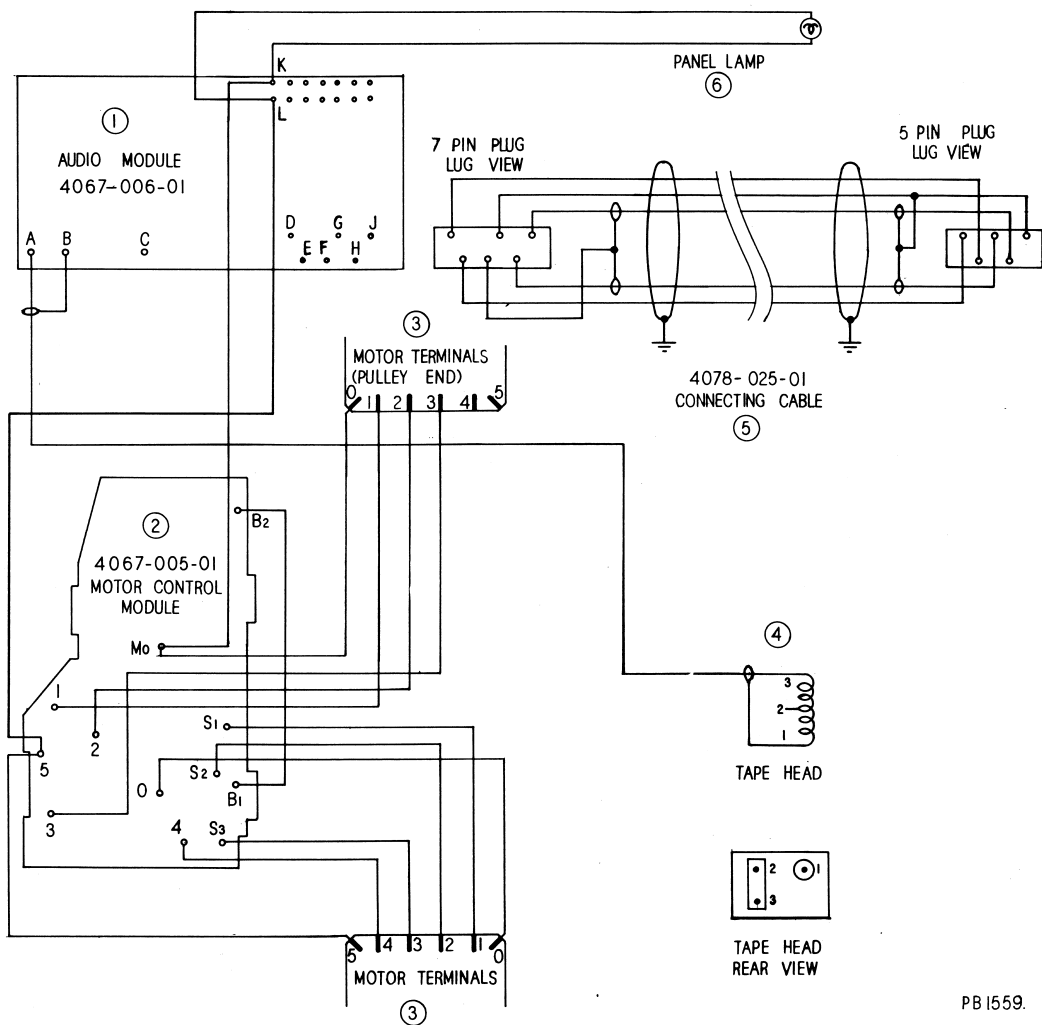


UNDER SIDE VIEW

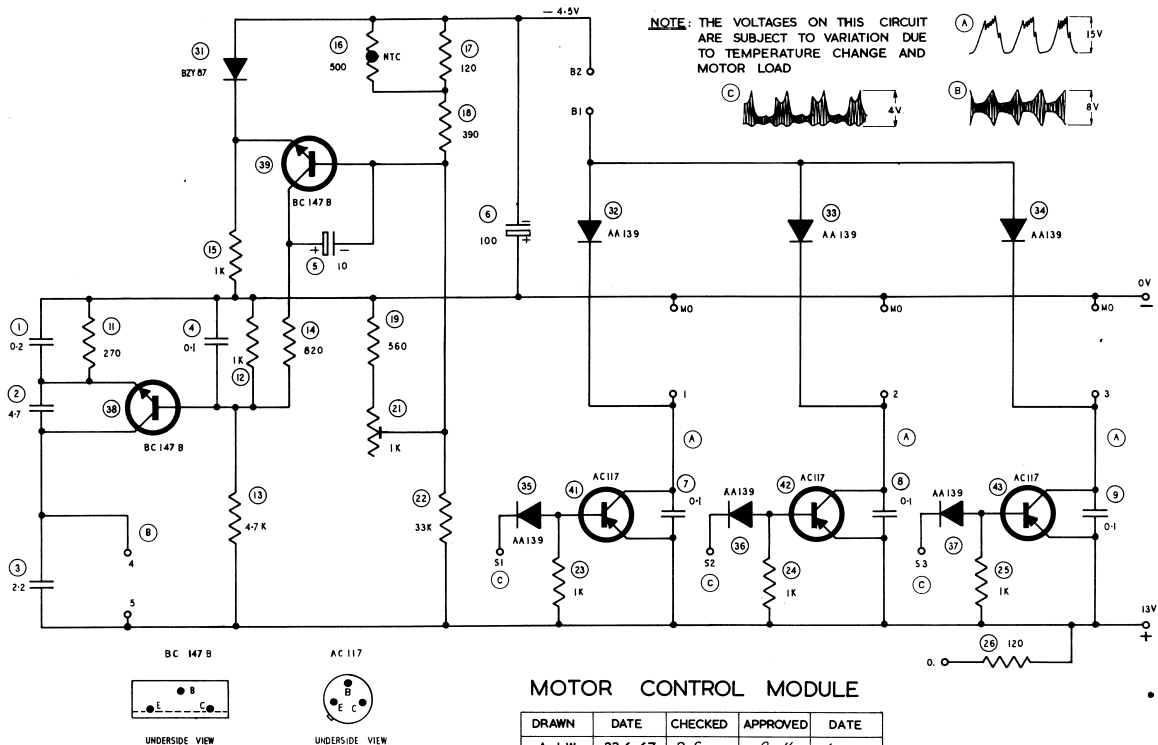
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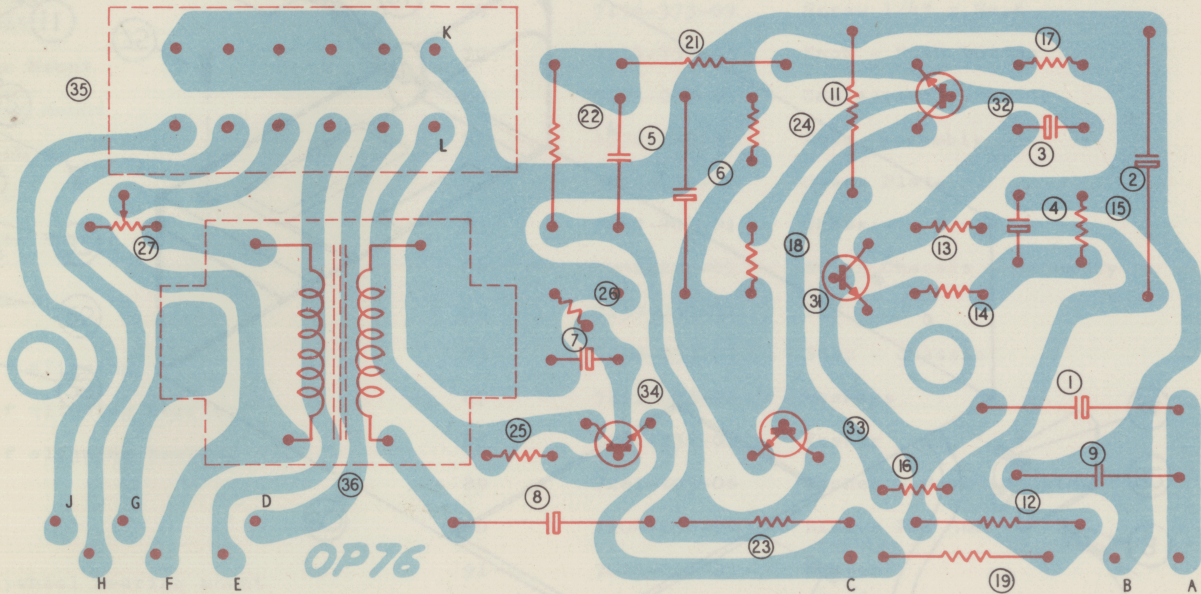
PB1541

ALL VOLTAGES MEASURED BETWEEN NEGATIVE LINE AND POINTS INDICATED
WITH A D.C. VACUUM TUBE VOLTMETER. NO SIGNAL INPUT.



PB 1559.





PB 1540 A B

DRAWN	DATE	CHECKED	APP'ED.	DATE
A.J.W.	9-6-67	B J	D.M.	21-11-67