

Service
Service
Service



Service Manual

FOUR TRACK AUTO EJECT STEREO CASSETTE PLAYER

12 V 

SPECIFICATIONS.

NUMBER OF TRACKS	— 4 Track — 2 Channels
TAPE CARTRIDGE	— Stereo/Monoural Compact Cassette
TAPE SPEED	— 4.75 cm/sec.
POWER OUTPUT	— 4 Watts min. RMS
SPEAKER IMPEDANCE	— 4 ohms per Channel
POWER INPUT	— 12V Negative to Earth
CURRENT	— Approx. 0.55 amp (at 0.5 Watt Output)
SEMI-CONDUCTORS	— 3 IC's 2 Transistors 4 Diodes



THE MICRO REED SWITCH

Micro reed switches basically consist of 2 reed pieces sealed inside a glass tube as shown in Fig. 1a. Magnetism is induced in the 2 reed pieces (N and S polarities) by the permanent magnet shown in Figs 1b and 1c.

When the magnetic attractive force exceeds the reed elasticity, the reed tips make contact with each other, thereby closing the circuit. When the magnetic field strength is reduced again, the reed tips spring back to their former positions, thereby opening the circuit.

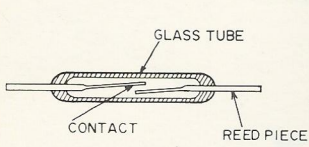


Fig. 1a Basic Structure of the Micro Reed Switch

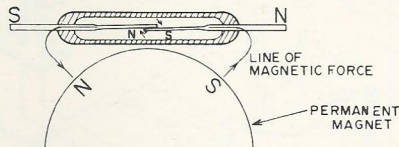


Fig 1b Switched ON Status

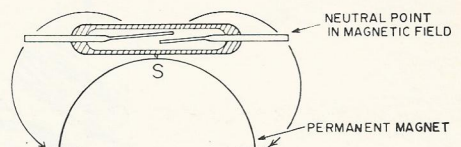


Fig. 1c Switched OFF Status

CASSETTE HOLDING & TAPE END DETECTOR CIRCUITS

Cassette holding in the AC290 is effected by using the electrical circuits described below in place of the conventional mechanical methods.

1. Cassette Holding Lock

- The cassette holding mechanism is operated by the solenoid E1 which is controlled by Q1 and Q2.
- The power switch is turned on by inserting the cassette tape. Because of the C35 charging current, a voltage is applied via R22 to the base of Q1 thereby turning Q1 ON.
- This causes Q2 to be turned on and a current to flow through the solenoid E1, thus operating the cassette holding mechanism.

2. Tape End Detector Circuit

- During the play mode, the magnet on the rotating take up reel causes the reed switch to constantly open and close, thus generating a 0V. to 6V. square wave which is applied across R25. This square wave is passed via C35 to charge up C36 thereby supplying bias to Q1 for the play mode to be continued.
- When the take up reel stops at the end of the tape, the reed switch stops operating and remains in either the ON or the OFF position.
- The input signal across R25 is now stopped and the C35 bias voltage discharged via R23. With this drop in bias voltage, Q1 is de-activated and the current to E1 is switched OFF. The holding lock is released, the cassette tape ejected and the power to the unit switched OFF.
- The cassette tape is ejected about 2 or 3 seconds after the take up reel stops.

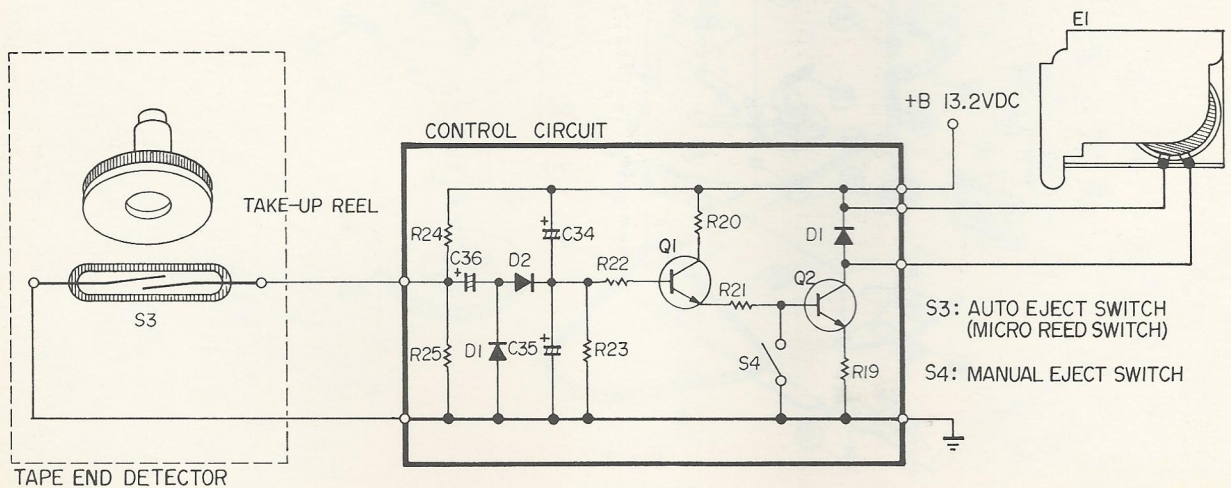


Fig. 2

Cont. on page 5

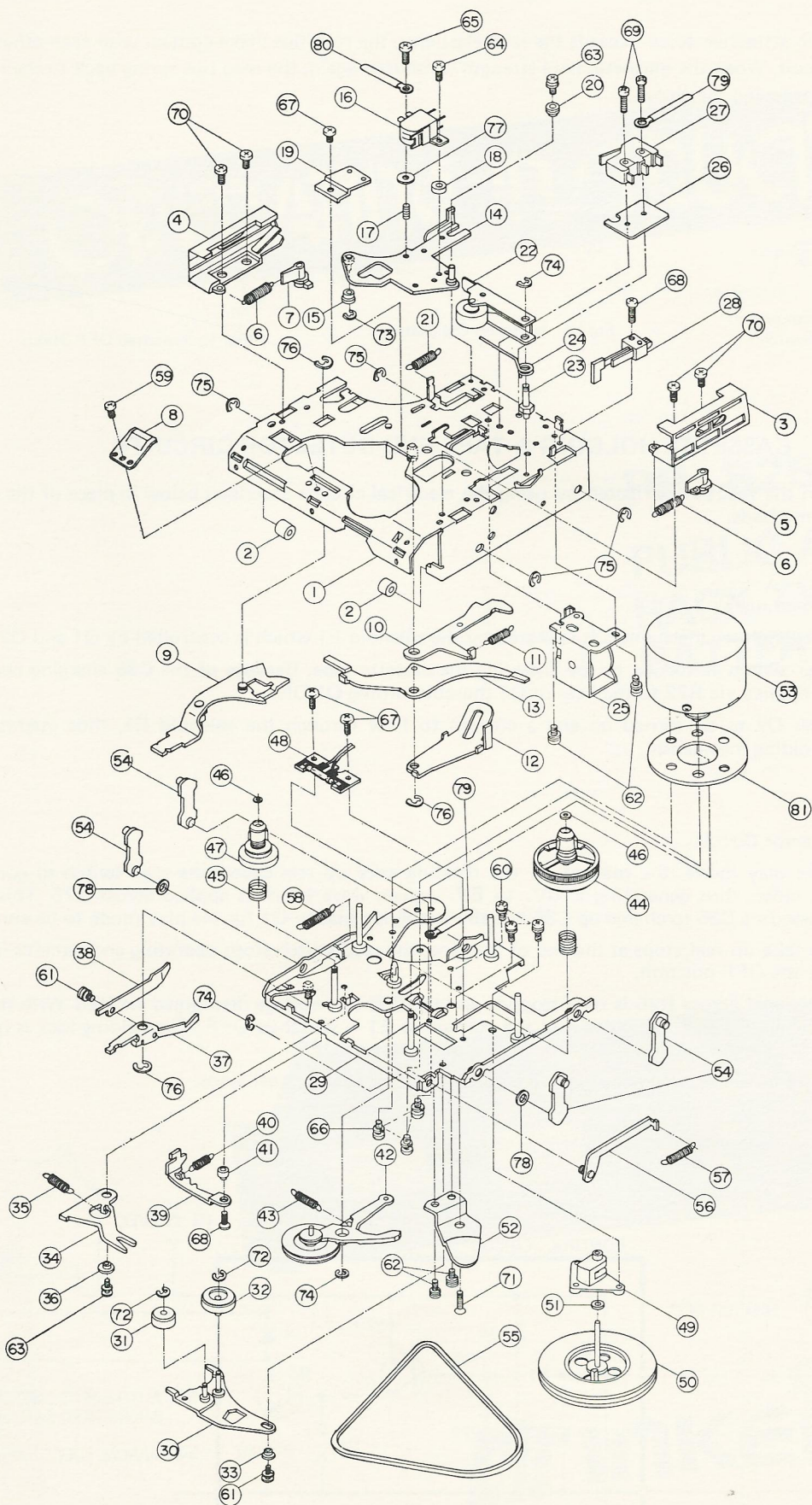


Fig. 3

EXPLODED VIEW

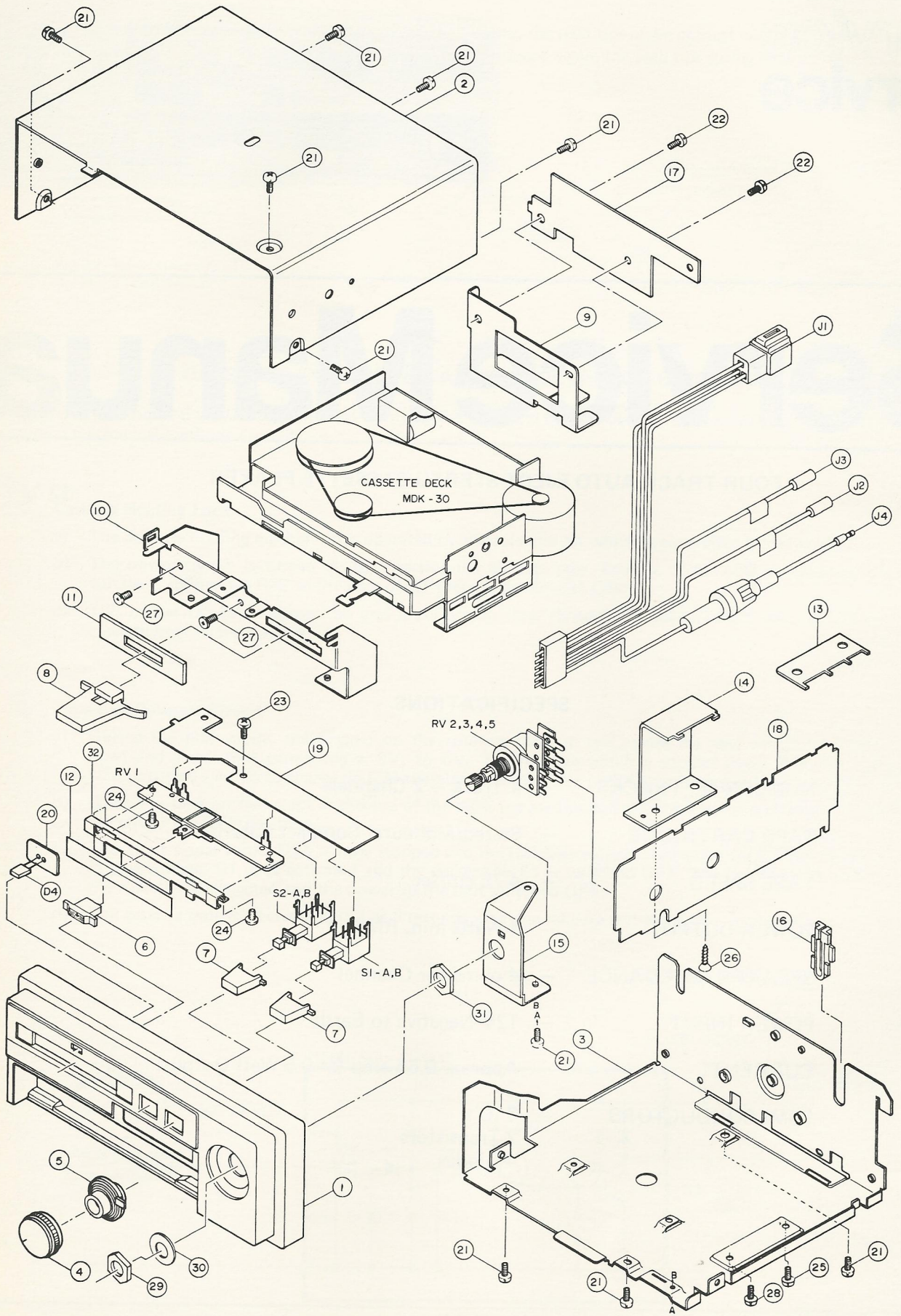


Fig. 3a

REPLACEMENT PARTS LIST

Ref. No.	Description	Service Code	Ref. No.	Description	Service Code
CAPACITORS			CASSETTE DECK		
NOTE: All capacitors are standard ceramic, mylar or polycarbonate types unless specified otherwise.			3	Runner, Right	4802 403 27039
C3, 4	10 μ f	16V Electro	4	Runner, Left	4802 403 27041
C5, 6	100 μ f	10V Electro	5	Lever	4802 403 27042
C9, 10	10 μ f	16V Electro	7	Lever	4802 403 27043
C11	220 μ f	10V Electro	8	Spring	4802 492 37237
C20, 21	100 μ f	10V Electro	16	Playback Head	4802 249 37012
C22, 23	47 μ f	10V Electro	22	Pinchroller	4802 403 47016
C24, 25	.15 μ f	16V Alox	25	Solenoid	4802 281 57011
C26	2200 μ f	16V Electro	27	Micro Switch (S1)	4802 271 37008
C27, 28	1000 μ f	10V Electro	28	Leaf Switch (S2)	4802 278 97041
C29, 30	.15 μ f	16V Alox	31	Roller	4802 403 27044
C34	10 μ f	16V Electro	32	Roller	4802 403 27045
C35	47 μ f	10V Electro	39	Cam	4802 403 27046
C36	22 μ f	16V Electro	42	Lever	4802 403 27047
			45	Spring	4802 492 57032
			47	Slip Mechanism	4802 528 27043
			48	PC Board Assy	4802 214 57086
			50	Flywheel	4802 528 87087
			53	Motor	4802 361 27045
			55	Belt	4822 358 30175
			68	Screw 2 x 8 mm	4822 502 10681
			70	Screw 2.6 x 4mm	4822 502 11084
			72	"E" Ring 1.2mm	4822 530 70119
			73	"E" Ring 1.5mm	4822 530 70121
			74	"E" Ring 2mm	4822 530 70122
			76	"E" Ring 3mm	4822 530 70123
RESISTORS & CONTROLS					
NOTE: All resistors are standard values and tolerance unless specified otherwise.					
RV1	20k ohms Balance	4802 105 17113			
RV2	10k ohms. + 10k ohms	4802 105 17108			
SEMI CONDUCTORS					
IC1	M51521L	4802 209 87107			
IC2	M51515L	4802 209 87283			
Q1	2SC828 QR	4822 130 40965			
Q2	2SC1317QR	4802 130 47338			
D1, 2	1S1555	4802 130 37033			
D3	1S1885	4802 130 37123			
D4	LED. LN310CP	4802 130 37305			
*Note:	When using substitute semiconductors check the base connections before assembling to the PC board.				
COILS					
L1, 2	Choke 0.74 μ H	4802 158 17077			
L3	Filter 0.85 μ H	4802 157 47036			
L4	Filter 1.8mH	4802 152 27035			
					</

3. Manual Eject

When the eject button is depressed, the leaf switch S4 is turned on, thereby grounding the Q2 base. Q2 is consequently turned off, the E1 solenoid released, and the cassette tape ejected.

4. Mechanical Eject Operations During Fast Forward and Rewind Modes

When the end of the tape is reached during fast forward and rewind modes, the tape end detector circuit is activated in the same manner as described above. However, there is a slight modification in the related mechanical operation sequence:

TAPE END → TAKE-UP REEL STOP (2-3 seconds) → E1 TURNS OFF → FAST FORWARD OR REWIND BUTTON IS RELEASED → TAPE EJECT.

PLAYBACK HEAD ADJUSTMENT (Azimuth)

Normally, the adjustment is precisely set at the factory and further adjustment should not be required unless the playback head or its mounting components are replaced.

Incorrect adjustment will cause a reduction in performance.

If the azimuth is moved, then carefully adjust the azimuth screw as shown in Fig. 4.

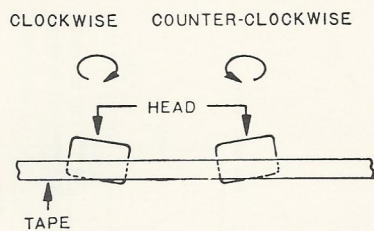
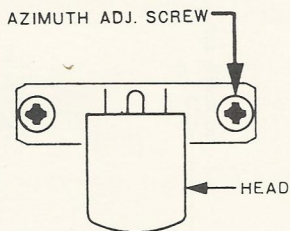


Fig. 4.

Using a Test Tape for Azimuth Adjustment

Insert a test tape and set the control knobs as follows:

VOL. CONTROL KNOB (VOL)	Normal Volume
BALANCE CONTROL KNOB (BAL)	Central
TONE CONTROL	Right Hand Side

Carefully adjust the azimuth adjustment screw for maximum volume and treble tones. It is recommended that a VTVM or Circuit Tester is connected to the speaker terminals for obtaining the maximum value because the test tape for azimuth adjustment is recorded in high treble tones.

If a test tape is not available, use a stereo music tape with some high treble tones (piano or violin music) and follow the same procedure as above.

CLEANING

After extended use, a layer of iron-oxide from the tape can build-up on the tape playback head and the drive capstan. The oxide layer prevents the tape from making full contact with the playback head, resulting in a gradual loss of high frequency response and an increased noise level. In the case of the capstan, the oxide deposit can cause slippage (wow) which might be mistaken for a more serious mechanical problem. To clean the head, a swab moistened with alcohol should be used.

WARNING — Do not use a solvent such as lighter fluid or thinners as these may cause damage to plastic parts or instrument finish.

First, using the end of a pencil, press the rod in the cassette door back until it clicks into position and then thoroughly clean the playback head, capstan and pinchroller.

After cleaning, press the eject button to return the rod to its original position.

DEMAGNETISATION

The playback head may become magnetised over a period of time. A magnetised head will record noise on a tape, even when it is being used for playback, so it is important that the head be periodically demagnetised. This can be done with a commercial demagnetiser (or degausser).

ADJUSTMENT FOR TAKE-UP TORQUE

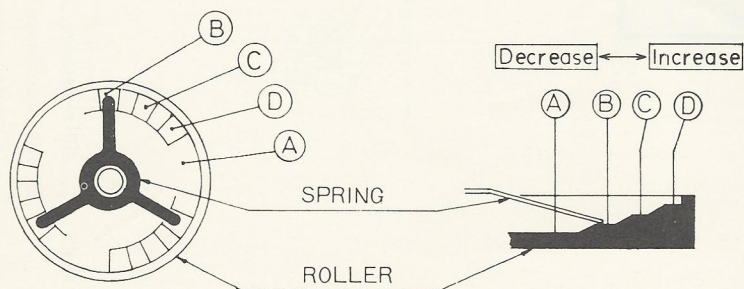
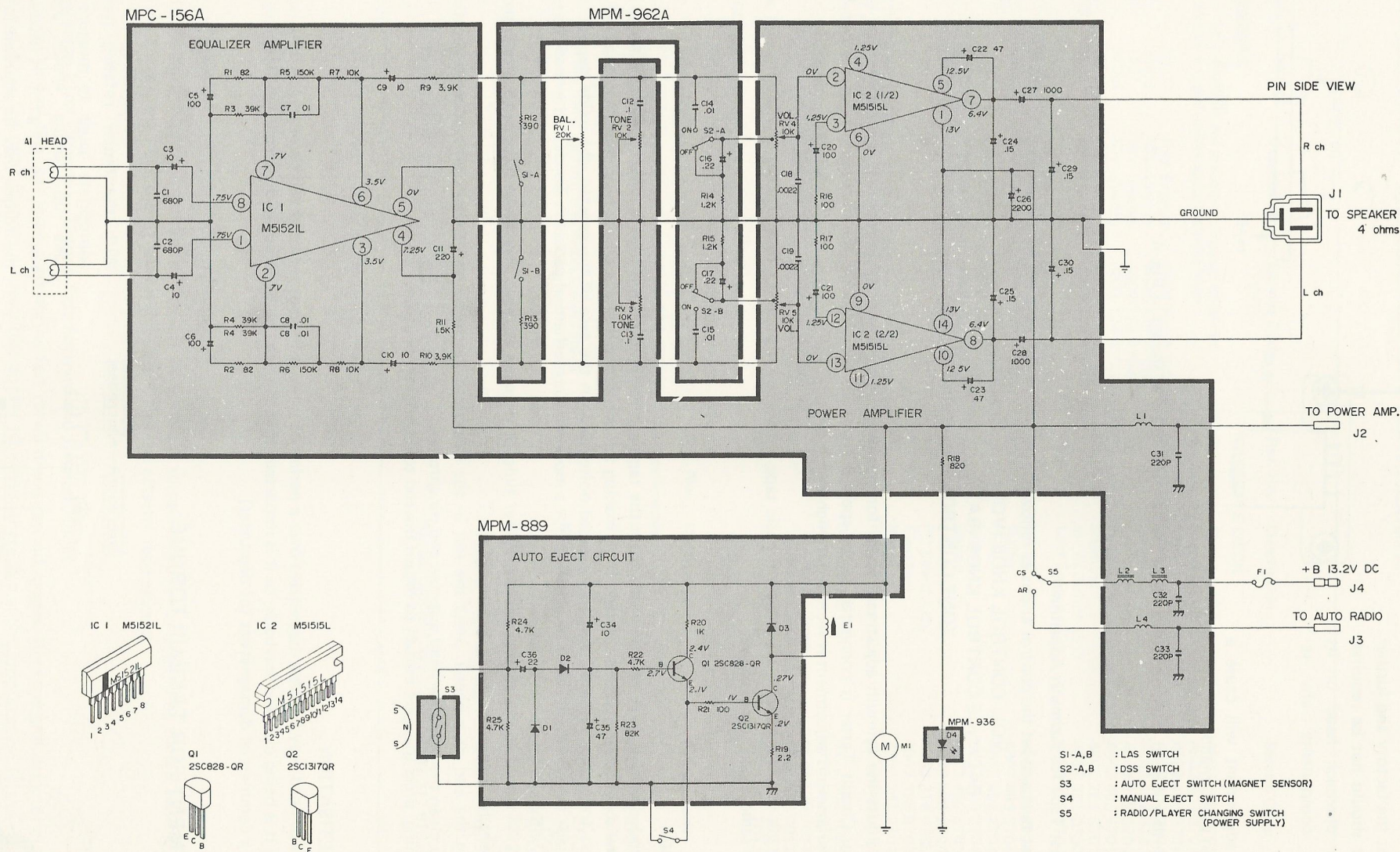


Fig. 5

With the motor rotating use an appropriate gauge to measure the take up torque which should normally be 50 g.cm. If necessary, the torque may be adjusted to this figure by moving the spring up or down the adjustment steps in the take up head. (See Fig. 5).

SCHEMATIC



NOTES: 1. All resistance in ohms, K=1000

2. All capacitance in μF , P= μF

3. DC voltages against the chassis measured with 100,000 ohms per volt meter, power supply set at +13.2 VDC, no signal input.

Fig. 6

WIRING ON PC BOARDS

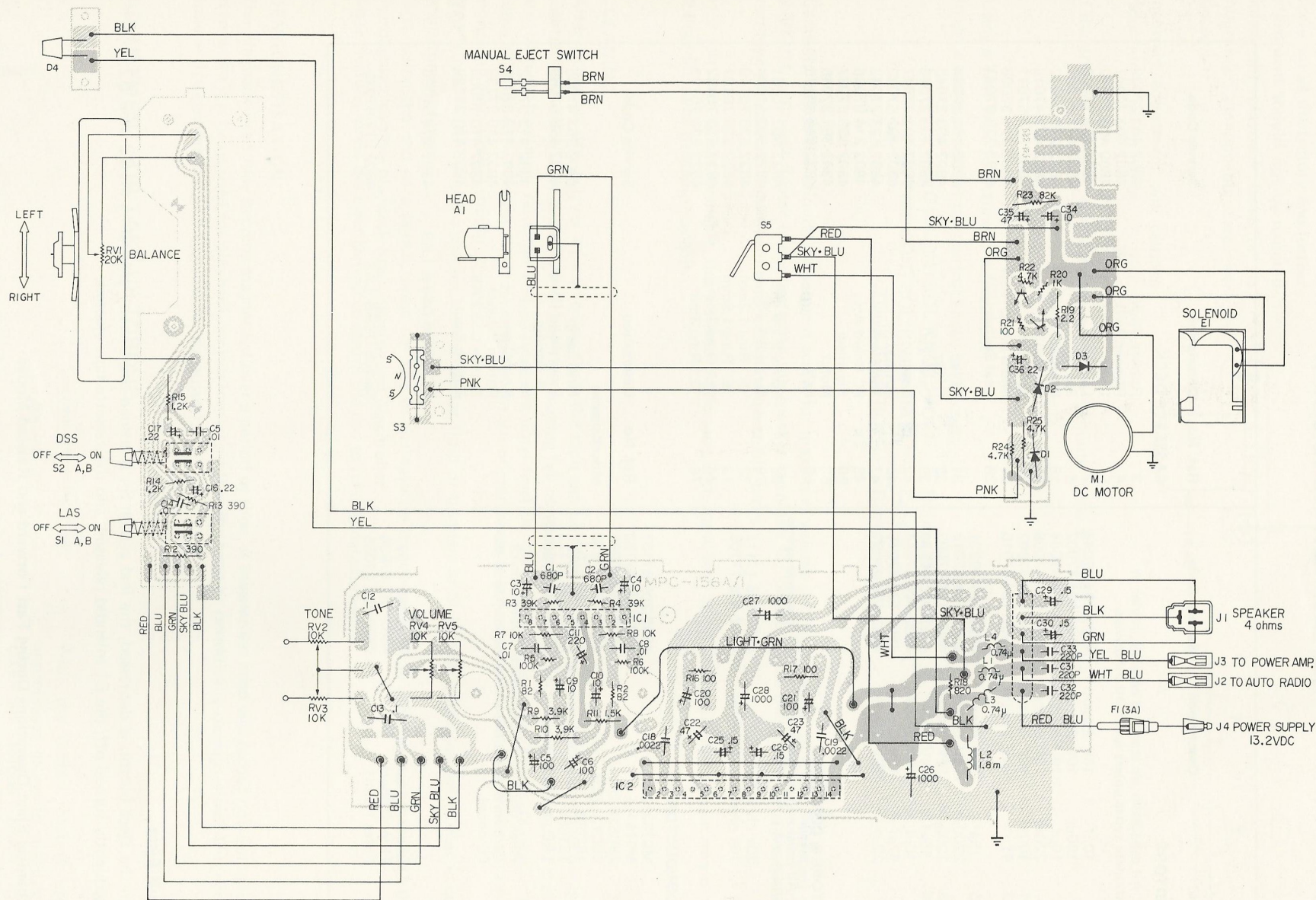


Fig. 7

IC	Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC 1		0.75V	0.7V	3.5V	7.25V	0V	3.5V	0.7V	0.75V						
IC 2		13.0V	0V	1.25V	1.25V	12.5V	0V	6.4V	6.4V	0V	12.5V	1.25V	1.25V	0V	13.0V

Tr.	Pin No.	B	C	E
Q 1		2.7V	2.4V	2.05V
Q 2		1.0V	0.27V	0.2V