DR-55 SERVICE NOTES

SPECIFICATIONS
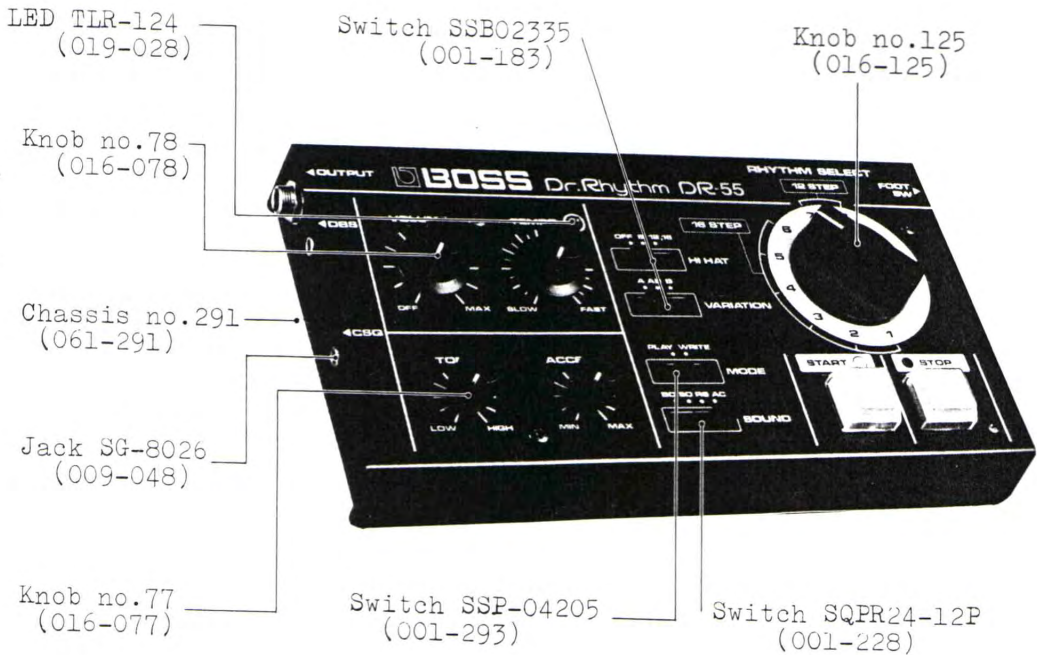
OUTPUT   DBS : +5 V (8 ms)   CSQ : +4 V (10 ms)

       VOICE : (at OUTPUT Jack, Power source 6 V)

         VOLUME, TONE : at max.   ACCENT : at min.

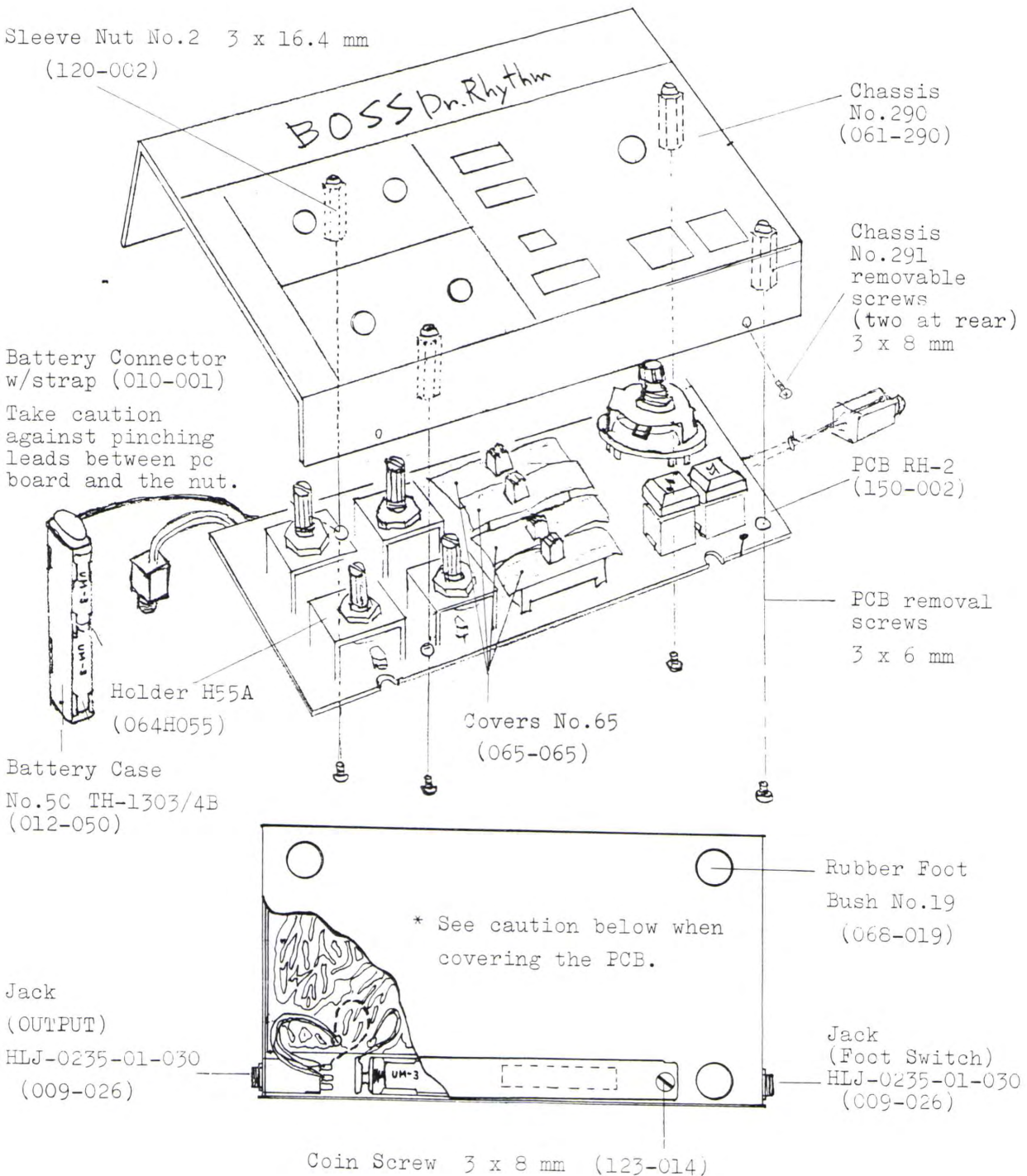|	Amplitude (Vpp)			Frequency (Hz)			Decay (ms)		
	min.	avr.	max.	min.	avr.	max.	min.	avr.	max.
BD	1.0	1.3	1.6	14	62 (16 ms)	18			
RS	0.7	0.9	1.2	0.65	0.75 (1330 ms)	0.85	5	7	10
SD (noise)	0.3	0.4 / 1.2	0.6	2.7	3.1 (320 ms)	3.5	55	75	100
HH		1.2					35	50	70

POWER REQUIREMENTS -- 4.5 V–6.5 V. (Current draw 5.5 mA @6 V)

DIMENSIONS -------- 211 (W) x 116 (D) x 53 (H) mm

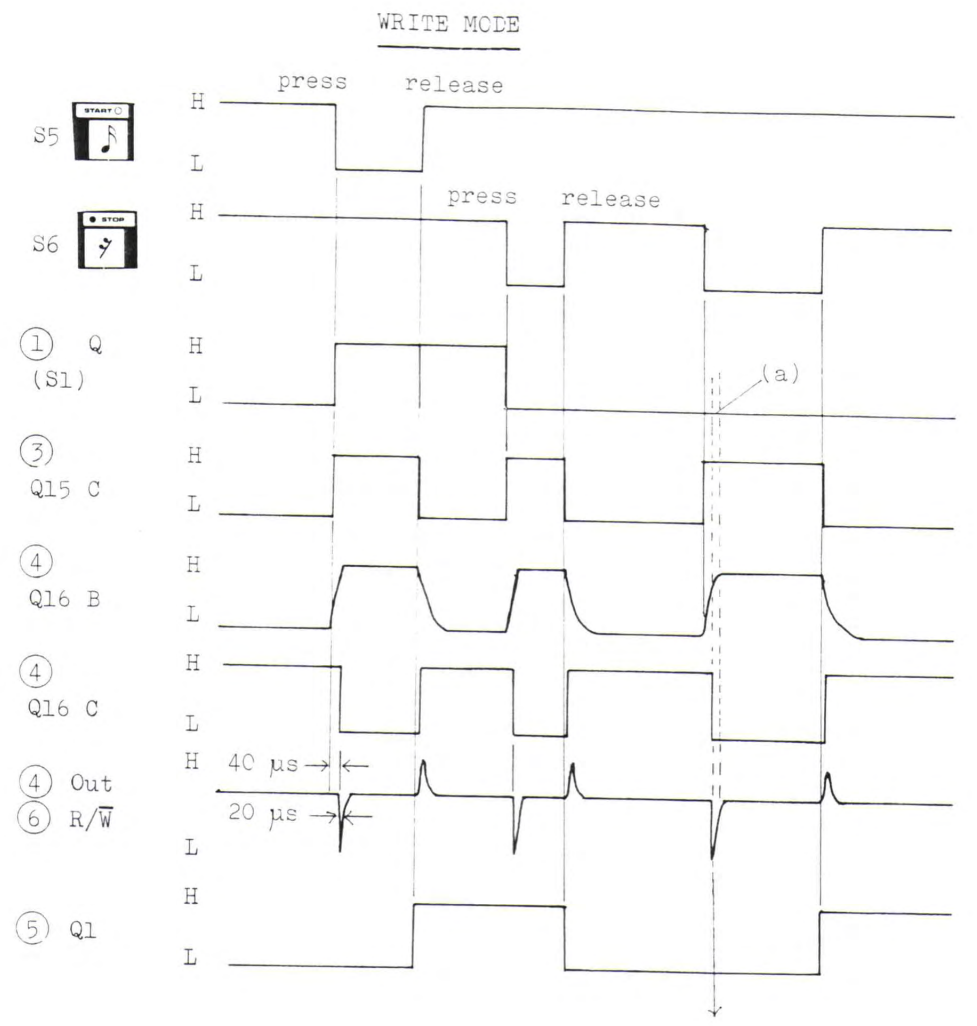WEIGHT -------------- 850 g

LED TLR-124 (019-028)

Switch SSB02335 (001-183)

Knob no.125 (016-125)

Knob no.78 (016-078)

Chassis no.291 (061-291)

Jack SG-8026 (009-048)

Knob no.77 (016-077)

Switch SSP-04205 (001-293)

Switch SQPR24-12P (001-228)

* For the START and STOP switches, refer to the Parts List

Sleeve Nut No.2 3 x 16.4 mm
   (120-002)

BOSS Dr.Rhythm

Chassis
No.290
(061-290)

Chassis
No.291
removable
screws
(two at rear)
3 x 8 mm

Battery Connector
w/strap (010-001)

Take caution
against pinching
leads between pc
board and the nut.

PCB RH-2
(150-002)

PCB removal
screws

3 x 6 mm

Holder H55A
   (064H055)

Covers No.65
   (065-065)

Battery Case
No.50 TH-1303/4B
(012-050)

Rubber Foot
Bush No.19
(068-019)

* See caution below when
   covering the PCB.

Jack
(OUTPUT)
HLJ-0235-01-030
   (009-026)

Jack
(Foot Switch)
HLJ-0235-01-030
(009-026)

Coin Screw 3 x 8 mm (123-014)

* CAUTION: Do not lay jack leads over the PCB as shown in dotted line.
          Since high gain stage is located on that area, the leads will
          provide feedback loop.

SOUND

S1

DI 4
3
2
DI 1

⑥ IC1 CMOS MEMORY (256 x 4 bit) 4
TC5501P-1 DO 3
2
ADDRESS

A6 5 0 1 A7   A2 3 4 CE R/W̄ VCC +B
6 5 4 3   7   2 1 21 17 20 22

VARI.
A
B

ENCODER
D6-D13

6V

LED DRIVE
Q13.14

⑤ Q1 2 3 4 Q5
DUAL BINARY COUNTER
IC2 MC14520B
E   R

1   8
S7
RHYTHM SELECT

BD
Q1. Q2

WRITE MODE

SD
Q10. Q11

ACCENT
Q3 ⑧

⑦

RS
Q6

① S̄ RS Q
F/F
IC3
R̄ 2/4 Q̄

10
CLOCK GENERATOR Q
② 2/4
4011UB

DBS

MODE
S2

P L A Y   W R I T E

AF AMP
Q4

S5
START/⌐

NOISE GENERATOR
Q8. Q9

OUTPUT

S6
STOP/⌐

SCHMITT TRIGGER ③
Q18.17.15

DELAY ④
Q16

HI HAT
Q7. Q12

S4
OFF   HI HAT
IC2 ← 8
IC3 ← 16

START ○ ♪ S5

● STOP ♪ S6

press   release

H
L

press   release

H
L

① Q (S1)
H
L

③ Q15 C
H
L

④ Q16 B
H
L

④ Q16 C
H
L

④ Out
⑥ R/W̄
H
L

⑤ Q1
H
L

40 μs →
20 μs →

(a)

Data (a) is written during this time.

PLAY MODE

START (S5)   STOP (S6)
ON   ON

① Q
H
L

$t_H \doteq 10$ ms
t_T $t_T = 45$ m-900 ms
t_H

② Q
⑤ E
⑥ CE
H
L

⑥ DO 1-4
H
L

⑤ Q1
H
L

⑤ Q2
H
L

CIRCUIT DESCRIPTION

The heading numbers of this circuit description correspond to those in the block diagram above.

FEB. 21,1980

    1   RS FLIP FLOP (2/4 IC3)

(a) PLAY Mode
When the START switch S5 is turned ON, the Q cutput goes to H and trig-
gers the Clock Generator (2). Mhen the STOP switch S6 is turned ON, the
Q output goes to L and the Clock Generator stops oscillation. At   this
time, the Q output goes to H and resets the Binary Counter (5)

(b) WRITE Mode
The Q output goes to H when S5 is turned ON, and goes to L when S6   is
turned ON. This condition is written in the Memory IC1 as a data.

    2   CLOCK GENERATOR (2/4 IC3)

The frequency of this oscillator is controlled with TEMPO VR-5.   This
oscillator functions in PLAY mode only, and feeds clock pulses to   the
Counter (5)

    3   SCHIMITT TRIGGER (Q15, 17, 18)

This circuit functions in WRITE mode only. The collector of Ql5 goes
H when either the START switch S5 or the STOP switch S6 is turned   ON,
and goes to L when the switch set to ON is turned OFF.

    4   DELAY CIRCUIT (Q16)

The output from the Schmitt circuit (3) is intergrated, and fed to the
base of Q16. Then the signal is trimmed to square wave at collector of
Ql6. This output signal is differentiated and becomes pulses, and then
is applied to the R/~W terminal of IC1.
The two pulses lag a little behind edges of Scmitt (3) output pulse.

    5   DUAL BINARY COUNTER (IC2)

This circuit counts pulses from the clock generator (2)   in PLAY mode,
and counts pulses from the Schmitt trigger (3) in WRITE mode, and then
outputs binary-coded signals from the terminals Ql-Q5; Ql-Q4 denote 16
steps composing each rhythm. Signal from Q5 is applied to A7 only when
the VARIATION switch is set to AB.
To the terminal A7, the L level voltage is given when the switch is set
to A and H when switch is set to B.

6   256 x 4 BIT CMOS MEMORY (IC1)

Reading/writing from/to this memory is as described below.
The upper 3 bits designate rhythms 1-8, the next one bit
designates
VARIATION A and B, and. the lower 4 bits 16 steps in one rhythm.
In PLAY mode, the terminal CE2 is connected. to the Clock
generator
output. The memory functions only when the clock is H, and
outputs
H's or L's from DO 1-4.
(When the clock is L, DO 1-4 becomes high impedance.)

In WRITE mode, when the terminal R/~W becomes L,a data from the
flip
flop is written in one of DI 1-4 via Sl.A previously stored data
is
rewritten from DO via R61-R64 to the remaining three DI's.

The Vcc of this rnemory chip is directly connected to the dry
cells
regardless of power switch positions, since the chip draws only
a
very slight idling current during stand-by. As a result, the
data
is guaranteed to be stored as long as the dry cells maintain
voltage
value higher than a specified. level.
The capacitor C39 (22 mfd.) connected to the terminal Vcc can
substi-
tute for the dry cells by its charge for several minutes when
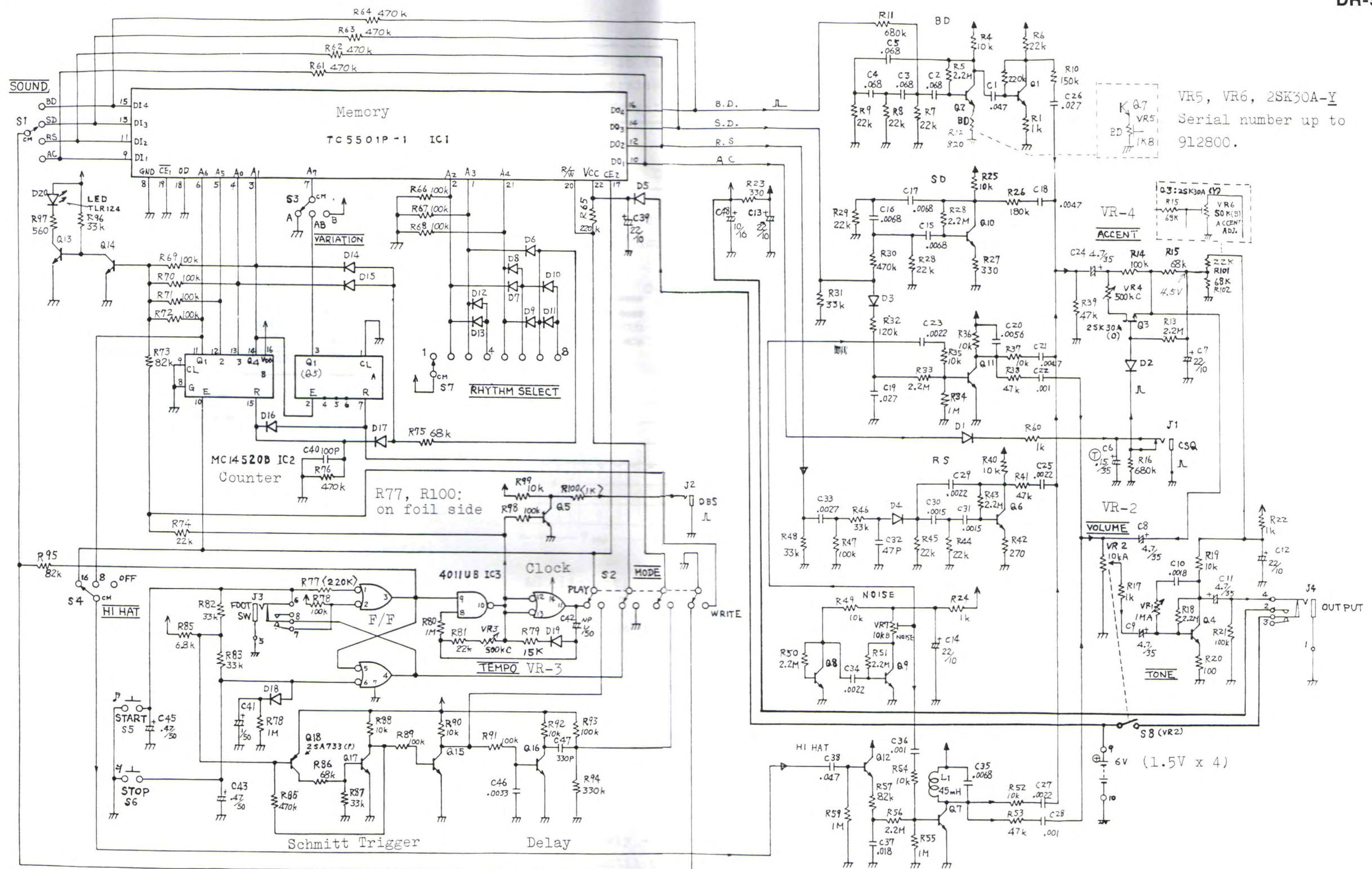the
cells are absent during replacement.

7   VOlCE GENERATOR (Ql, 2, 3, 7, 8, 9, 10, ll)

BD, SD and RS are triggered by pulses from the respective DO's. HI
HAT is triggered by pulses from the counter IC2 or the Clock gen-
erator IC3 by every step or every other step.

8   ACCENT (Q3)

Each sound source output is mixed and outputted through the resis-
tor network in which Q3 is connected in parallel.When ACCENT pulse
is outputted from DO l, Q3 turned ON, and in this ON period the
signal amplitude increases. The DO l pulse can be externally out-
putted through the CSQ jack.When this jack is enga.ged,

however,the
ACCENT function of the DR-55 proper becomes invalid.

FEB. 21, 1980

DR-55

SOUND
BD
SD
RS
AC

Memory
TC5501P-1 IC1

VR5, VR6, 2SK30A-Y
Serial number up to
912800.

B.D.
S.D.
R.S
A.C

BD

SD

VR-4
ACCENT

MC14520B IC2
Counter

R77, R100:
on foil side

VARIATION

RHYTHM SELECT

DBS

Clock

MODE

PLAY

WRITE

4011UB IC3

TEMPO VR-3

HI HAT

FOOT SW

START
STOP

Schmitt Trigger

Delay

RS

NOISE

HI HAT

VR-2
VOLUME

OUTPUT

TONE

S8 (VR2)

6V (1.5V x 4)

Serial number   up to 923500   with 923600
IC3 -- CD4011UB only   IC3 -- TC4011UBP or CD4011UB
VR-3 -- 500KC   VR-3 -- 1MC
C42 -- 1mfd N.P.   C42 -- 0.47mfd N.P.
R79 -- 6.8K   R79 -- 15K
R81 -- 22K   R81 -- 47K

Q13-17 : 2SC945- P or Q

PARTS LIST

061-290	Chassis	no.290	(panel)
061-291	Chassis	no.291	
061-292	Chassis	no.292(battery compartment lid)	
111-019	Bush	no.19 (rubber foot)	

016-077	Knob	no.77	TONE,	ACCENT
016-078	Knob	no.78	VOLUME,	TEMPO
016-125	Knob	no.125	RHYTHM SELECT	

009-026	Jack	HLJ-0235-01-030 ¼"		
009-048	Jack	SG-8026	mini.	DBS, CSQ

PCB

150-002 RH-2 (PCB 052-537)

SWITCH

001-183	SSB02335	slide	HI HAT, VARIATION
001-228	SQPR24-12P	slide	SOUND
001-293	SSP-04205	rotary	RHYTHM SELECT
001-299-1	KED-10903-1 START		assy w/key top,
001-299-2	KED-10903-2 STOP		cap and mark

*Cap and mark are available separately.

POTENTIOMETER

028-755	VM10RC38C	1MA	VR1	TONE
028-372	VM11R5M1411	10KA w/sw	VR2	VOLUME
028-776	VM10RC38C	500KC	VR4	ACCENT

VR3 TEMPO--S/N up to 923500

028-777	VM10RC38C	1MC	VR3	with S/N 923600
030-519	EVNK4AA00B13	1K	trimmer	
030-522	EVNK4AA00B54	50K	S/N up to 912800	
030-521	EVNK4AA00B14	10K		

SEMICONDUCTOR

017-023	2SC945-P		transistor
017-091	2SK30A -O or -Y see circuit dia.FET		
017-024	2SA733-P		transistor
018-014	1S2473	or equiv.	diode
019-028	TLR-124 red		LED
020-030	TC-5501P-1	1024-bit	CMOS RAM
020-081	CD-4011UBE	or TC4011UBP	
	refer to circuit diagram		
020-166	MC-14520P	dual binary up counter	

OTHERS

022-030	Choke coil no.30	45mH	
120-002	Sleeve nut no.2	3 x 16.4 mm	
064H55A	Holder H55A	potentiometer	
012-050	Battery case TH-1303/4B		
010-001	Battery connector w/strap		
123-014	Screw 3x8mm battery compartment lid		
107-059	Cushion no.59 battery		
	Cover (felt strip) slide switch		

RH-2 (150-002) (PCB 052-537)

ADJUSTMENT & CHECKING
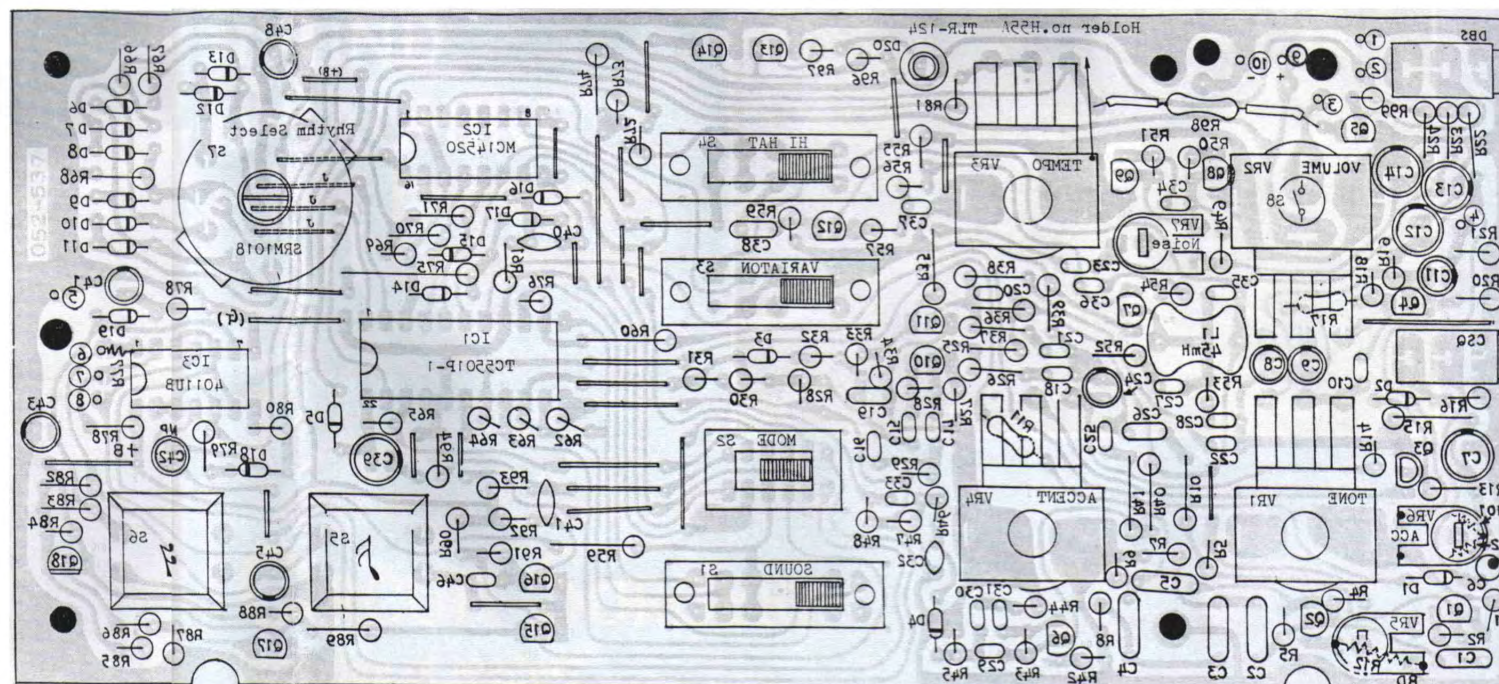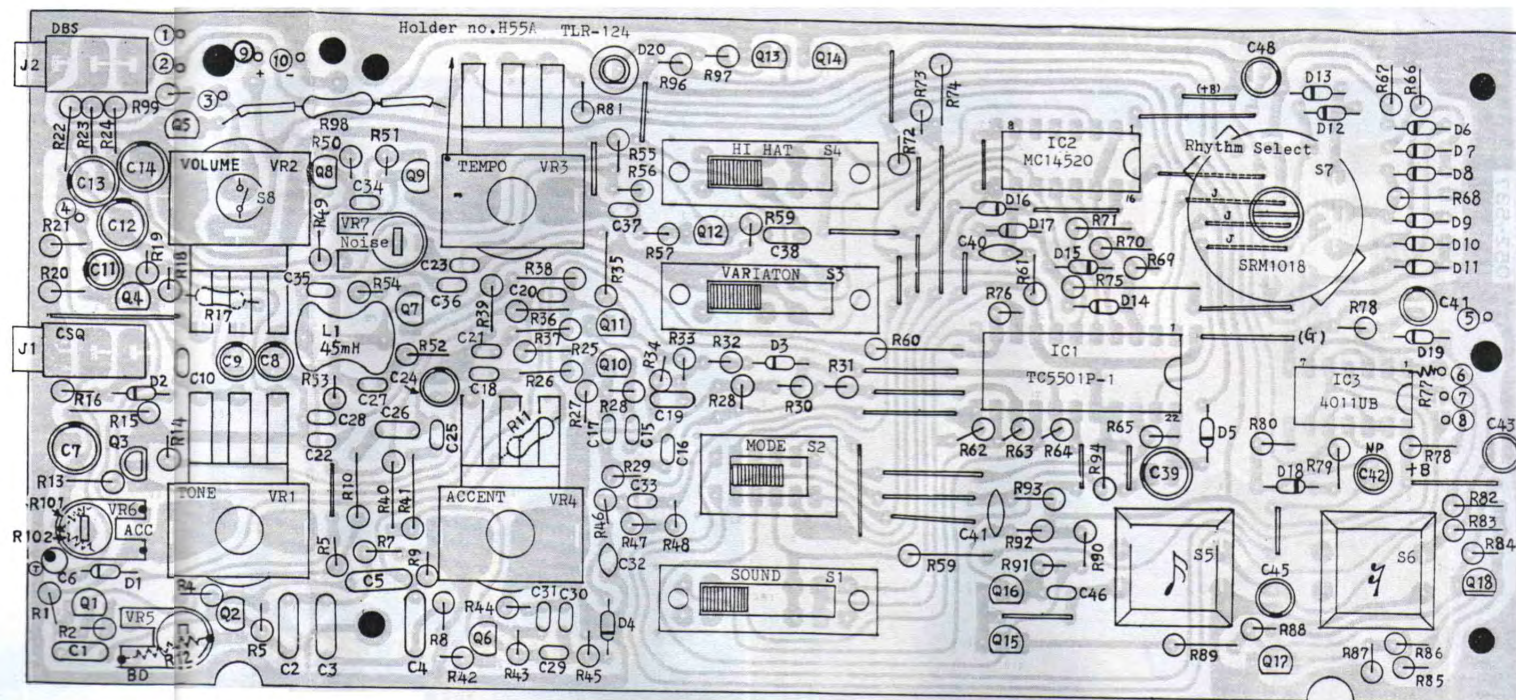
(For writting rhythm patterns, refer to page 4 of the DR-55 OWNER's Manual.)

OUTPUT   6 V

UM-3 x4

VR-7 NOISE

DBS
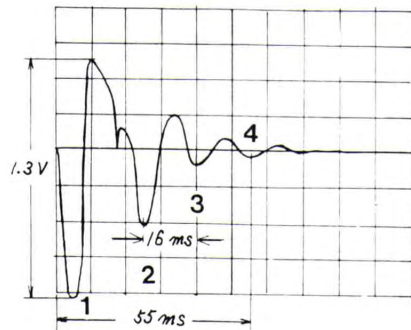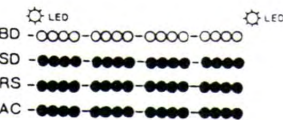
V   H
IN   EXT.
     TRIG.

VR-5 BD
VR-6 ACC
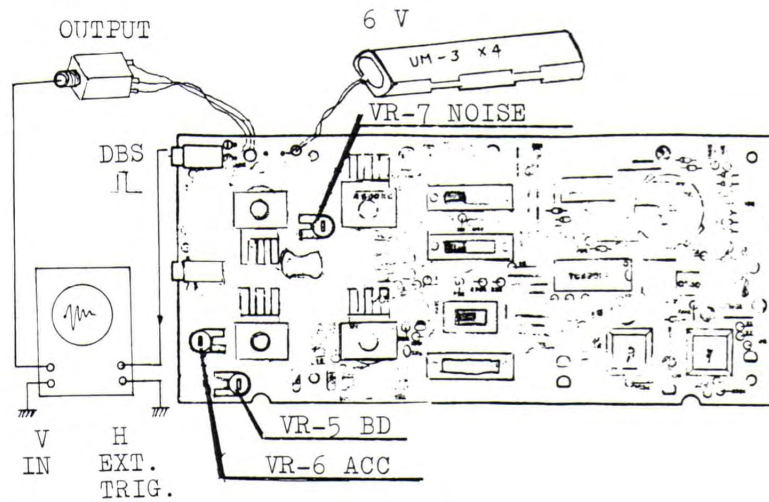
BD (Bass Drum)

No adjustment is needed for the units with serial numbers 912900 and subsequent, -just check.

With following settings, write pattern into DB channel.

BD -oooo-oooo-oooo-oooo
SD -●●●●-●●●●-●●●-●●●●
RS -●●●●-●●●●-●●●●-●●●●
AC -●●●●-●●●●-●●●●-●●●●

RHYTHM SELECT: 1	VOLUME: MAX
VARIATION: A	MODE: WRITE
HI HAT: OFF	SOUND: BD

Set MODE to PLAY.
Press START.
Set TEMPO for 100 ms DBS pulse interval.
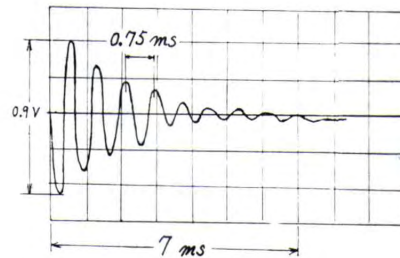Adjust VR-5 for 55 ms decay time.

The waveforms in this page will be obseved when DR-55 operates from 6 V dc and will vary with different supply voltages.

RS (Rim Shot) Check only

With panel controls set as below, write and reproduce RS sound.

BD -●●●●-●●●●-●●●-●●●●
SD -●●●●-●●●●-●●●-●●●●
RS -oooo-oooo-oooo-oooo
AC -●●o●-oo●o-●o●o-ooo●
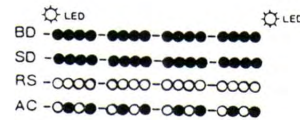
RHYTHM SELECT:	1
HI HAT:	OFF
VOLUME:	MAX
TONE:	MAX
ACCENT:	MIN
SOUND:	RS
	AC

AC (Accent)

(No need for the units with serial numbers 912900 and subsequent.)

While sounding RS in the same manner as above, set controls:

ACCENT: MAX   VARIATION: A
TEMPO: MAX   SCOPE's Time Base: 0.5 ms
HI HAT: OFF

Turn VR-6 slowly -- in the direction AC increases-- until accenturated RS becomes double normal RS amplitude.
Note: Turning effect of VR-6 is delayed because of time constant in that circuit.
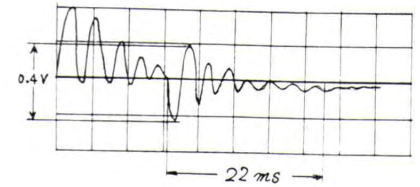

SD (Snare Drum) check only

With the following settings, write into SD channel.

RHYTHM SELECT:	1
VARIATION:	A
HI HAT:	OFF
VOLUME:	MAX
ACCENT:	MIN

BD ●●●●-●●●●-●●●●-●●●●
SD ....-....-....-....
RS ●●●●-●●●●-●●●●-●●●●
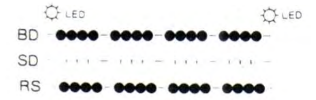
Set MODE to PLAY.
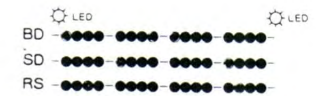Press START.
Minimize NOISE by turning VR-7.

Adjust TEMPO for 100 ms DBS pulse interval.
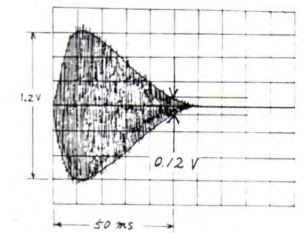Check displayed waveform for the figure above.

HI HAT

Clear all the memories in BD, SD, and RS channels.

Set panel controls:

RHYTHM SELECT:	1
VARIATION:	A
HI HAT:	12-16
VOLUME:	MAX
ACCENT:	MIN

BD ●●●●-●●●●-●●●●-●●●●
SD ●●●●-●●●●-●●●●-●●●●
RS ●●●●-●●●●-●●●●-●●●

Press START.
Adjust VR-7 for 1.2 Vpp.

CSQ and DBS (observed at jacks)

TEMPO MAX. : 9 ms
MIN. : 12 ms

TEMPO MAX. : 12 ms
MIN. : 18 ms

5.5V

TEMPO MAX. : 45-55 ms
MIN. : 650-900 ms