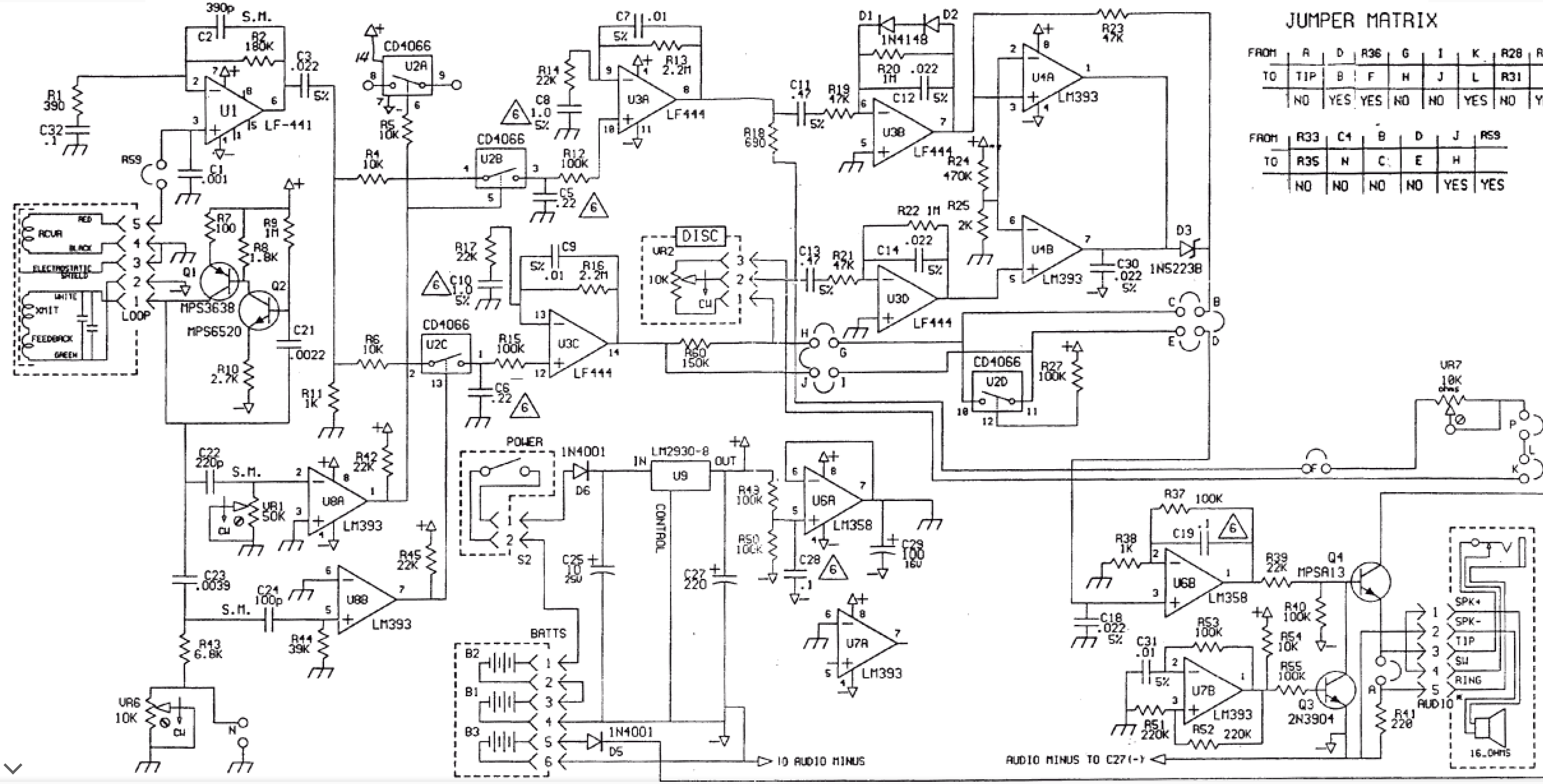
White's Classic I schematic diagram


390p S.M.
C2
R2 180K
C3 .022
5%
R1 390
C32 .1
U1
LF-441
R59
C1 .001
RCVR
RED
BLACK
ELECTROSTATIC SHIELD
XMIT
WHITE
FEEDBACK
GREEN
LOOP
R7 100
R8 1.8K
R9 1M
Q1
MPS3638
Q2
MPS6520
C21 .0022
R10 2.7K
R11 1K
CD4066
U2A
R5 10K
R4 10K
U2B
R12 100K
C5 .22
R14 22K
C8 1.0 5%
C7 .01 5%
R13 2.2M
U3A
LF444
R18 690
C11 .47 5%
R19 47K
D1
D2
1N4148
R20 1M
.022
C12 5%
U3B
LF444
R23 47K
U4A
LM393
R24 470K
R25 2K
R22 1M
U4B
LM393
C30 .022 5%
D3
1N5223B
DISC
VR2
10K
CW
C13 .47 5%
R21 47K
C14 .022 5%
U3D
LF444
R17 22K
C10 1.0 5%
C9 .01 5%
R16 2.2M
U3C
LF444
R6 10K
U2C
R15 100K
C6 .22
R60 150K
U2D
R27 100K
VR7 10K
C22 220p S.M.
VR1 50K
U8A
LM393
R42 22K
C23 .0039
C24 100p S.M.
U8B
LM393
R45 22K
R43 6.8K
R44 39K
VR6 10K
POWER
S2
1N4001
D6
LM2930-8
IN
OUT
U9
CONTROL
C25 10 25V
C27 220
R43 100K
R50 100K
U6A
LM358
C29 100 16V
C28 .1
U7A
LM393
BATTS
B1
B2
B3
1N4001
D5
TO AUDIO MINUS
R37 100K
C19 .1
R38 1K
U6B
LM358
R39 22K
Q4
MPSA13
R40 100K
C18 .022 5%
C31 .01 5%
R53 100K
R54 10K
U7B
LM393
R55 100K
Q3
2N3904
R41 220
R51 220K
R52 220K
SPK+
SPK-
TIP
SW
RING
AUDIO
16 OHMS
AUDIO MINUS TO C27(-)

JUMPER MATRIX

FROM	A	D	R36	G	I	K	R28	R32
TO	TIP	B	F	H	J	L	R31	P
	NO	YES	YES	NO	NO	YES	NO	YES

FROM	R33	C4	B	D	J	R59
TO	R35	N	C	E	H	
	NO	NO	NO	NO	YES	YES

with no bells or whistles, only an on/off switch and a turn knob for a discriminator. It did not have much depth but it did find coins, jewelry and relics in the hand of a skilled hobbyist. While the Classic I was good for its day, there are now better beginner metal detectors on the market.

The detector used 4 transistors (MPS3638, MPS6520, MPSA13 and 2N3904) and only a few ICs: a CD4066 digital switch, three LM393 dual comparators, LF444, LF441, LM358 op-amp ICs and an LM2930-8 3-terminal positive regulator.

All resistors in the schematic are 1/4 watt, +/- 5% tolerance and all capacitors are in microfarads unless marked otherwise. Capacitors greater than 1uF are aluminum electrolytics. Capacitors less than 1uF are polyester film type. Capacitors marked with a triangle are stacked polyester type. Areas inside dashed lines are not located on the main PCB.

See also:

Heathkit Groundtrack GR-1290 VLF metal detector
Heathkit Cointrack Gd-1190 Metal Locator
White's Surfmaster PI metal detector schematic diagram
Simple BFO metal detector schematic diagram