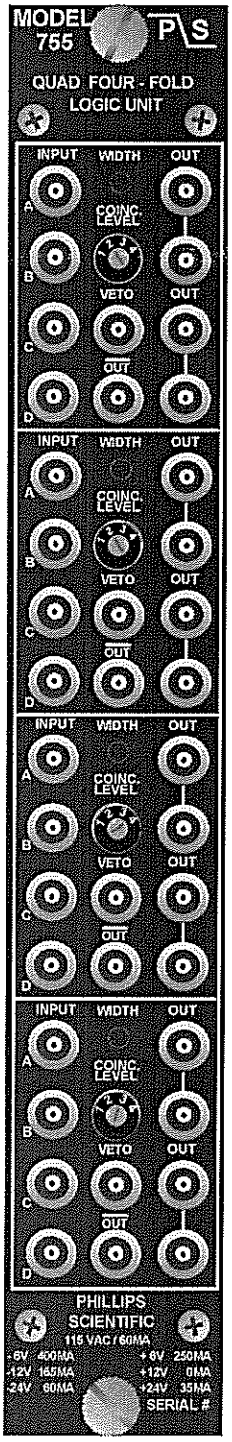
Phillips Scientific

Quad Majority Logic Unit

NIM MODEL 755

FEATURES

* *Versatile Logic Module with Majority Level Selection*
* *Four Independent Channels*
* *150 MHz Rate Capability*
* *Deadtimeless Updating Outputs*
* *Fast Veto for Anti-Coincidence Decisions*



DESCRIPTION

The model 755 logic unit contains four channels of four input logic with veto in a single width NIM module. Logic AND, OR, Majority logic, Fan-in/Fan-out, and anti-coincidence functions can be performed with this versatile module. All functions are direct coupled and operate to over 150 MHz with input overlap times as narrow as 1nSec.

Each channel has four logic inputs, an anti-coincidence input, a coincidence level switch, and five outputs with common width control. The inputs are enabled by connecting the input cable to the desired input, eliminating errors often occuring with switched inputs. The setting of the coincidence level switch then determines whether a logic OR, AND, or Majority logic function will produce an output.

After the inputs have satisfied the logic function desired, triggering of an updating regenerative stage produces a standardized output pulse, variable from 4nSec to 1μSec, independent of the input pulse shapes or overlap times. The updating feature ensures deadtimeless operation, while the double-pulse resolution is 6.5nSec for fast counting applications.

The outputs are the current source type with two pairs of negative bridged outputs and one complement for each channel. When only one output of a bridged pair is used, a double-amplitude NIM pulse (-32mA) is generated for driving long cables with narrow pulse widths. The outputs have transition times of typically 1nSec, and their shapes are virtually unaffected by the loading conditions of the other outputs.

Phillips Scientific "A THEORY DEVELOPMENT COMPANY"
31 Industrial Ave * Mahwah, NJ 07430 * (201) 934-8015 * Fax (201) 934-8269

INPUT CHARACTERISTICS

A,B,C,D:
Four (4) LEMO connector inputs per section; Accepts NIM level logic signals (-500mV), 50 ohm input impedance, ±2%, direct coupled; Input reflections are less than ±5% for a 1nSec input risetime. Inputs are protected to withstand ±50Volts for 1μSec with no damage. The inputs respond to a 1nSec or longer input pulse width.

Fast Veto:
One LEMO connector input per section; accepts normal NIM level logic signal, (-500mV), 50 ohm input impedance, direct coupled; Protected against damage for ±50Volt input transients. Requires a 3.5nSec minimum input pulse width in time with the input pulse leading edge to inhibit.

Bin Gate:
Rear panel slide switch enables or disables slow bin gate via the rear connector. Signal levels are in accordance with the TID-20893 standard. The entire module will inhibit within 10nSec from the bin gate signal.

OUTPUT CHARACTERISTICS

General:
Five (5) LEMO connector outputs per section; Two pairs of negative bridged outputs and one complemented NIM. The bridged outputs deliver -32mA into a single 50 ohm load (-1.6Volts) and -16mA (-800mV) with both terminated. The complementary output is quiescently -16mA (-800mV) and goes to 0mA during output. The output rise and fall times are less than 1.5nSec from 10% to 90% levels. The output shapes are optimized when the bridged outputs are 50 ohm terminated.

Width Control:
One control per section; 15-turn screwdriver adjustment. Outputs are continuously variable from 4nSec to 1μSec. Width stabilty is better than ±0.15%/°C of setting.

Updating Output:
The output pulse will be extended if a new input pulse occurs while the output is active. This provides deadtimeless operation and a 100% duty cycle can be achieved.

GENERAL PERFORMANCE

Logic Functions:
Logical AND, OR, Majority logic and Fan-in/Fan-out. All functions have leading edge inhibit and produce restandardized outputs.

Continuous Repetition Rate:
Greater than 150 MHz guaranteed throughput counting rate (typically 160 MHz), with output width set at minimum.

Pulse-Pair Resolution:
Better than 6.5nSec, typically 6.2nSec with output width set at minimum.

Input to Ouput Delay:
Less than 8.5 nSec.

Multiple Pulsing:
None; One and only one output pulse regardless of input pulse amplitude or duration.

Power Supply Requirements:

- 6 Volts @ 400 mA	*+ 6 Volts @ 250 mA*	*115 VAC @ 60 mA*
-12 Volts @ 165 mA	*+12 Volts @ 0 mA*	
-24 Volts @ 60 mA	*+24 Volts @ 35 mA*	

***Note:** All currents are within NIM specification limits permitting a full powered bin to be operated without overloading.*

Operating Temperature:
0 °C to 70 °C ambient.

Packaging:
Standard single width NIM module in accordance with TID-20893 and Section ND-524.

Quality Control:
Standard 36-hour, cycled burn-in with switched power cycles.

Options:
Call Phillips Scientific to find out about available options.

12/03

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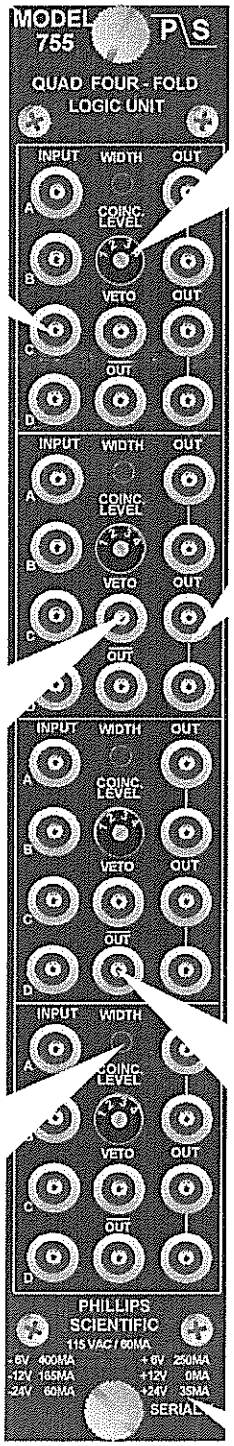
MODEL 755 QUAD MAJORITY LOGIC UNIT

(Front Panel Description)

Standard # 1 NIM Packaging
in accordance with TID-20893



Four NIM Logic Inputs;
50 ohms Direct Coupled

Four Position Coincidence Level Switch;
Selects Logic OR, AND or Majority
Logic Function for each Section.

Two Pairs Double-Amplitude Bridged
NIM Outputs; Each Pair Drives
-32mA (-1.6 Volts into 50 ohms, and
-.8 Volt into Two 50 ohm Loads).

Fast Inhibit Input; 50 ohms;
Accepts Normal NIM Input Pulse
to Provide Anti-Coincidence.

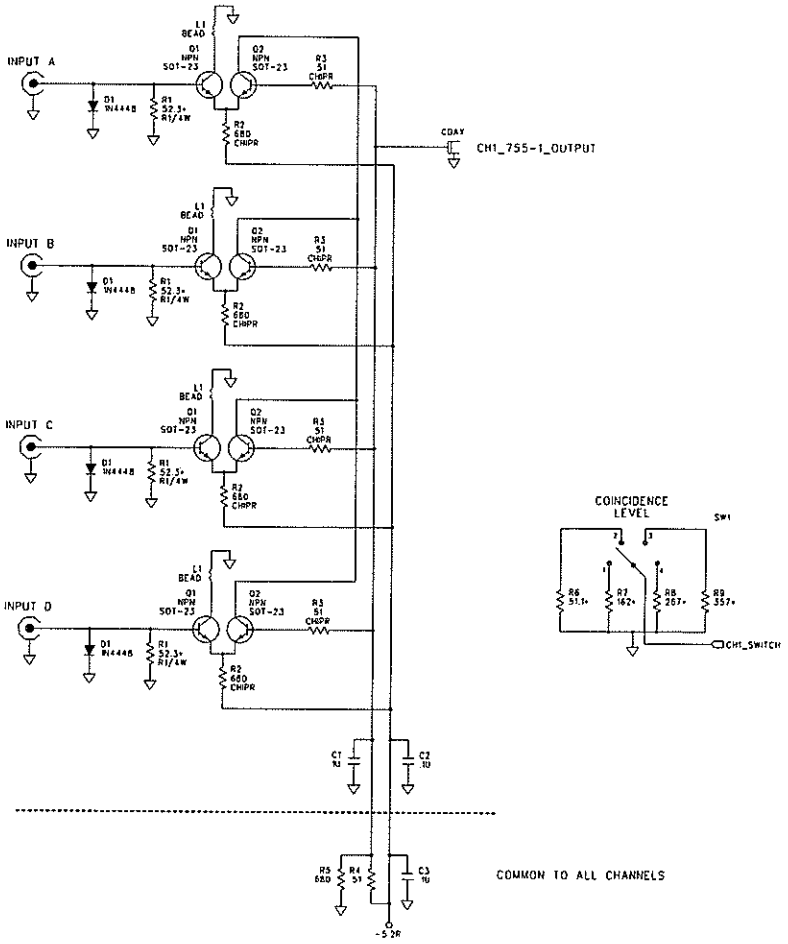
Output Width Control;
15-Turn Screwdriver Adjustment
Variable from 4nSec to 1μSec.

One Complemented NIM Output;
Quiescently -16mA (-800 mV) and
0 mA (0 Volts) during Output.

NIM Voltage and Current
Requirements

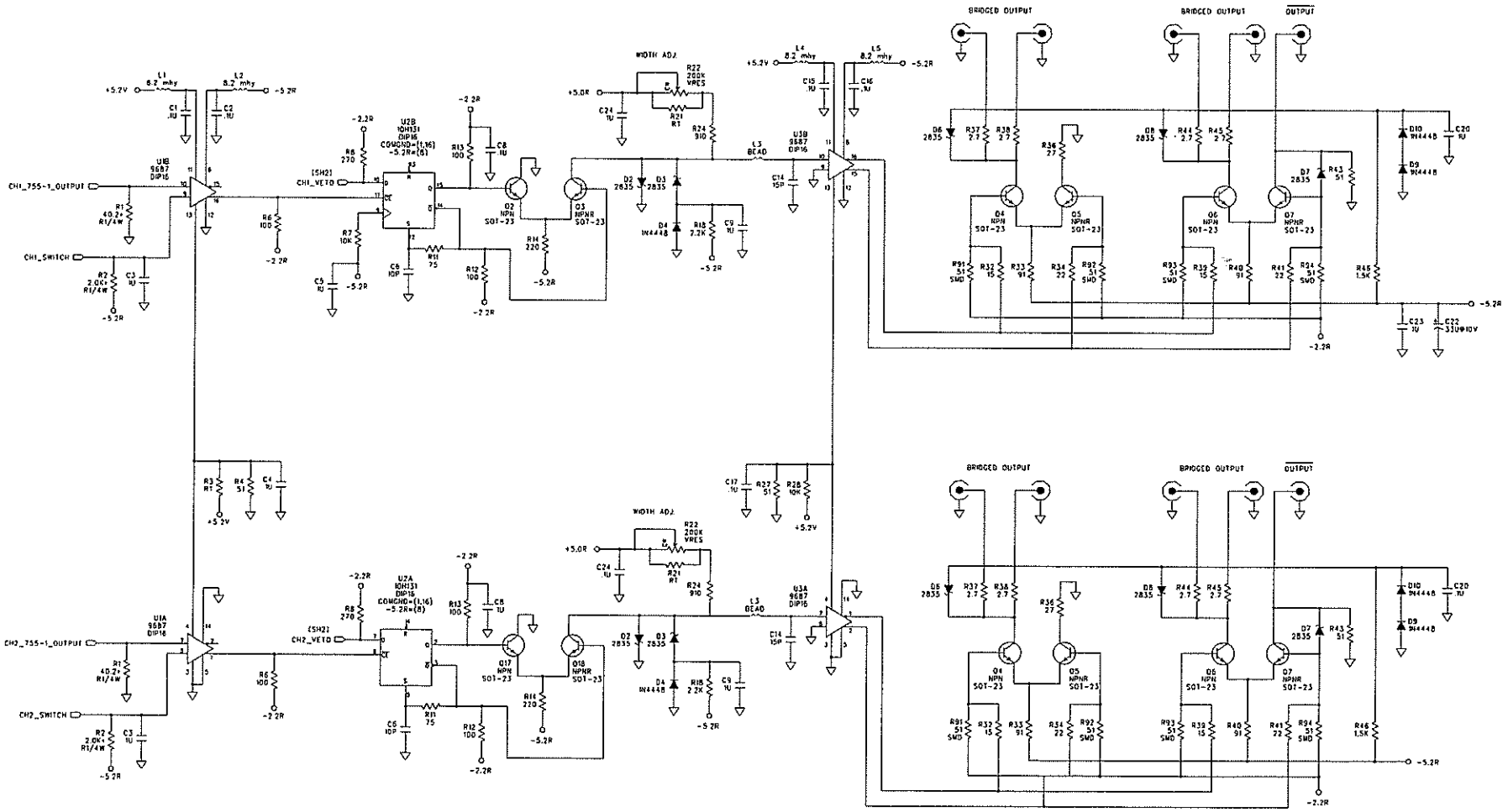
Note: A Bin Gate Enable/Disable Switch on Rear Panel, Permits Inhibiting via Bin Connector.

ONE OF FOUR IDENTICAL CHANNELS



PHILLIPS SCIENTIFIC		
MODEL 755-1 LOGIC UNIT		
DATE		FILE
08-13-99	REV. A	755-1

TWO OF FOUR CHANNELS



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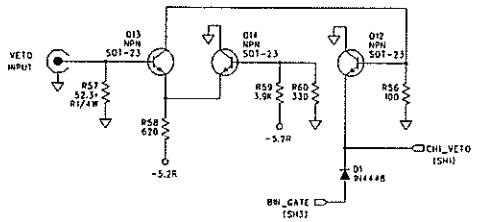
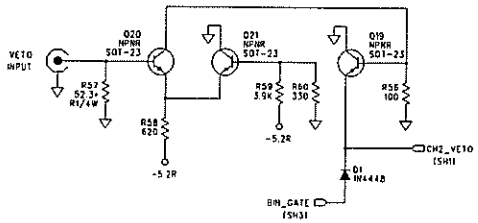
MODEL 755 QUAD MAJORITY LOGIC UNIT		
DATE		FILE
08-13-99	REV. A	75501

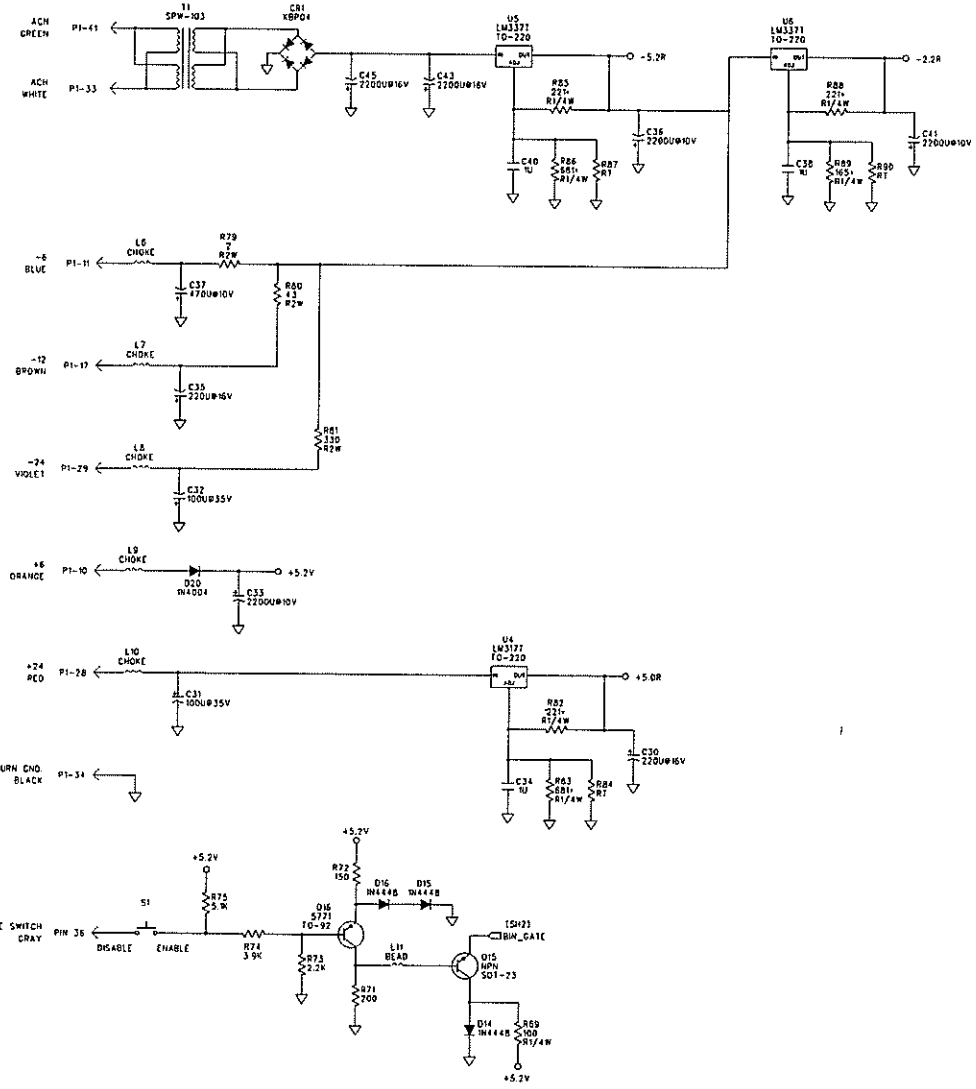
TWO OF FOUR CHANNELS

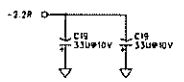


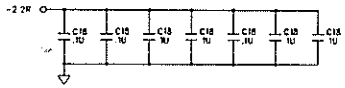


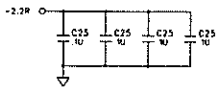
PHILLIPS SCIENTIFIC		
MODEL 755 QUAD MAJORITY LOGIC UNIT		
DATE		FILE
08-13-99	REV. A	75502

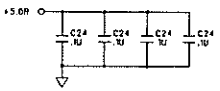
COMMON TO ALL CHANNELS

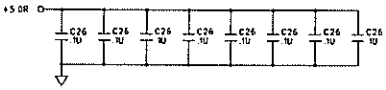












PHILLIPS SCIENTIFIC		
MODEL 755 QUAD MAJORITY LOGIC UNIT		
DATE		FILE
08-13-99	REV. A	75503

MODEL 755-1 PART LIST REV. A

Ident.	Qty.	Part Number	Description
R1	16	006552R3	52.3 ohm 1% RN 1/4 resistor
R2	16	00706800	680 ohm 2% SMD 1/8 resistor
R3	16	007051R0	51 ohm 5% SMD 1/8 resistor
R4	1	001051R1	51 ohm 5% CF 1/8 resistor
R5	1	00106800	680 ohm 5% CF 1/8 resistor
R6	1	002551R1	51.1 ohm 1% MF 1/8 resistor
R7	1	00251620	162 ohm 1% MF 1/8 resistor
R8	4	00252670	267 ohm 1% MF 1/8 resistor
R9	4	00253570	357 ohm 1% MF 1/8 resistor
C1	4	10151003	.1 mfd cer mono capacitor
C2	4	10151003	.1 mfd cer mono capacitor
C3	1	10151003	.1 mfd cer mono capacitor
L1	16	15000003	Single turn on 14000003
D1	16	20004448	1N4448 Diode
Q1	16	2420NPN0	NPN (SMD) (R2) transistor
Q2	16	2420NPN0	NPN (SMD) (R2) transistor
SW1	4	50005000	Rotary switch SP 4 position
	4	47060178	RG178BU coaxial cable
	1	85007541	754-1/755-1/756-1 Rev. E Printed Circuit Bd.

MODEL 755 PART LIST Rev. A

Ident.	Qty.	Part Number	Description
R1	4	006540R2	40.2 ohm 1% RN 1/4 resistor
R2	4	00652001	2.0K ohm 1% RN 1/4 resistor
R3	2	00000000	Resistor Trim
R4	2	001051R0	51 ohm 5% CF 1/8 resistor
R5			Not Used
R6	4	00101000	100 ohm 5% CF 1/8 resistor
R7	2	00101002	10K ohm 5% CF 1/8 resistor
R8	4	00102700	270 ohm 5% CF 1/8 resistor
R9-10			Not Used
R11	4	001075R0	75 ohm 5% CF 1/8 resistor
R12	4	00101000	100 ohm 5% CF 1/8 resistor
R13	4	00101000	100 ohm 5% CF 1/8 resistor
R14	4	00102200	220 ohm 5% CF 1/8 resistor
R15-17			Not Used
R18	4	00102201	2.2K ohm 5% CF 1/8 resistor
R19-20			Not Used
R21	4	00000000	Resistor Trim
R22	4	05102003	200K ohm 15 turn 3/4 Rect Pot
R23			Not Used
R24	4	00109100	910 ohm 5% CF 1/8 resistor
R25-26			Not Used
R27	2	001051R0	51 ohm 5% CF 1/8 resistor
R28	2	00101002	10K ohm 5% CF 1/8 resistor
R29-31			Not Used
R32	4	001015R0	15 ohm 5% CF 1/8 resistor
R33	4	001091R0	91 ohm 5% CF 1/8 ressistor
R34	4	001022R0	22 ohm 5% CF 1/8 resistor
R35	4	001051R0	51 ohm 5% CF 1/8 resistor
R36	4	001027R0	27 ohm 5% CF 1/8 resistor
R37	4	00102R70	2.7 ohm 5% CF 1/8 resistor
R38	4	00102R70	2.7 ohm 5% CF 1/8 resistor
R39	4	001015R0	15 ohm 5% CF 1/8 resistor
R40	4	001091R0	91 ohm 5% CF 1/8 resistor
R41	4	001022R0	22 ohm 5% CF 1/8 resistor
R42			Not Used
R43	4	001051R0	51 ohm 5% CF 1/8 resistor
R44	4	00102R70	2.7 ohm 5% CF 1/8 resistor
R45	4	00102R70	2.7 ohm 5% CF 1/8 resistor
R46	4	00101501	1.5K ohm 5% CF 1/8 resistor
R47-55			Not Used
R56	4	00101000	100 ohm 5% CF 1/8 resistor
R57	4	006552R3	52.3 ohm 1% RN 1/4 resistor
R58	4	00106200	620 ohm 5% CF 1/8 resistor
R59	4	00103901	3.9K ohm 5% CF 1/8 resistor
R60	4	00103300	330 ohm 5% CF 1/8 resistor
R61-68			Not Used
R69	1	00111000	100 ohm 5% CF 1/4 resistor
R70			Not Used
R71	1	00102000	200 ohm 5% CF 1/8 resistor
R72	1	00101500	150 ohm 5% CF 1/8 resistor
R73	1	00102201	2.2K ohm 5% CF 1/8 resistor
R74	1	00103901	3.9K ohm 5% CF 1/8 resistor
R75	1	00105101	5.1K ohm 5% CF 1/8 resistor
R76-78			Not Used
R79	1	00342R00	2 ohm 5% MOF 2w resistor
R80	1	003443R0	43 ohm 5% MOF 2w resistor
R81	1	00345600	330 ohm 5% MOF 2w resistor

Ident.	Qty.	Part Number	Description
R82	1	00652210	221 ohm 1% RN 1/4 resistor
R83	1	00656810	681 ohm 1% RN 1/4 resistor
R84	1	00000000	Resistor Trim
R85	1	00652210	221 ohm 1% RN 1/4 resistor
R86	1	00656810	681 ohm 1% RN 1/4 resistor
R87	1	00000000	Resistor Trim
R88	1	00652210	221 ohm 1% RN 1/4 resistor
R89	1	00651650	165 ohm 1% RN 1/4 resistor
R90	1	00000000	Resistor Trim
R91	4	007151R0	51 ohm 5% SMD 1/8 resistor
R92	4	007151R0	51 ohm 5% SMD 1/8 resistor
R93	3	007151R0	51 ohm 5% SMD 1/8 resistor
R94	3	007151R0	51 ohm 5% SMD 1/8 resistor
R95	1	001051R0	51 ohm 5% CF 1/8 resistor
R96	1	001051R0	51 ohm 5% CF 1/8 resistor
C1	2	10151003	.1 mfd cer mono capacitor
C2	2	10151003	.1 mfd cer mono capacitor
C3	4	10151003	.1 mfd cer mono capacitor
C4	2	10151003	.1 mfd cer mono capacitor
C5	2	10151003	.1 mfd cer mono capacitor
C6	4	101010P0	10 pfd NPO cer disc capacitor
C7			Not Used
C8	4	10151003	.1 mfd cer mono capacitor
C9	4	10151003	.1 mfd cer mono capacitor
C10-13			Not Used
C14	4	101015P0	15 pfd NPO cer disc capacitor
C15	2	10151003	.1 mfd cer mono capacitor
C16	2	10151003	.1 mfd cer mono capacitor
C17	2	10151003	.1 mfd cer mono capacitor
C18	7	10151003	.1 mfd cer mono capacitor
C19	2	10813305	33 mfd @ 10v tan capacitor
C20	4	10151003	.1 mfd cer mono capacitor
C21			Not Used
C22	2	10813305	33 mfd @ 10v tan capacitor
C23	2	10151003	.1 mfd cer mono capacitor
C24	8	10151003	.1 mfd cer mono capacitor
C25	4	10151003	.1 mfd cer mono capacitor
C26	8	10151003	.1 mfd cer mono capacitor
C27			Not Used
C28	4	10101002	.01 mfd cer disc capacitor
C29			Not Used
C30	1	10522206	220 mfd @ 16v al el capacitor
C31	1	10541006	100 mfd @ 35v al el capacitor
C32	1	10541006	100 mfd @ 35v al el capacitor
C33	1	10624707	2200 mfd @ 10v al el capacitor
C34	1	10151003	.1 mfd cer mono capacitor
C35	1	10522206	220 mfd @ 16v al el capacitor
C36	1	10624707	2200 mfd @ 10v al el capacitor
C37	1	10514706	470 mfd @ 10v al el capacitor
C38	1	10151003	.1 mfd cer mono capacitor
C39			Not Used
C40	1	10151003	.1 mfd cer mono capacitor
C41	1	10624707	2200 mfd @ 10v al el capacito
C42			Not Used
C43	1	10622207	2200 mfd @ 16v al el capacitor
C44			Not Used

Ident.	Qty.	Part Number	Description
C45	1	10622207	2200 mfd @ 16v al el capacitor
L1	2	15000001	8.2 mhs Choke
L2	2	15000001	8.2 mhs Choke
L3	4	15000003	Single turn on 14000003
L4	2	15000001	8.2 mhs Choke
L5	2	15000001	8.2 mhs Choke
L6	1	15000000	Power Inductor
L7	1	15000000	Power Inductor
L8	1	15000000	Power Inductor
L9	1	15000000	Power Inductor
L10	1	15000000	Power Inductor
L11	1	15000003	Single turn on 14000003
T1	1	15500003	SPW-103 Power Transformer
D1	4	20004448	1N4448 diode
D2	4	20202835	Schottky diode
D3	4	20202835	Schottky diode
D4	4	20004448	1N4448 diode
D5			Not Used
D6	4	20202835	Schottky diode
D7	4	20202835	Schottky diode
D8	4	20202835	Schottky diode
D9	4	20004448	1N4448 diode
D10	4	20004448	1N4448 diode
D11-13			Not Used
D14	1	20004448	1N4448 diode
D15	1	20004448	1N4448 diode
D16	1	20004448	1N4448 diode
D17-19			Not Used
D20	1	20004004	1N4004 diode
CR1	1	2030BP04	KBP04 Bridge Rectifier
Q1			Not Used
Q2	2	2420NPN0	NPN (SMD) (R2) transistor
Q3	2	2420NPNR	NPN (SMD) reverse transistor
Q4	4	2420NPN0	NPN (SMD) (R2) transistor
Q5	4	2420NPNR	NPN (SMD) reverse transistor
Q6	4	2420NPN0	NPN (SMD) (R2) transistor
Q7	4	2420NPNR	NPN (SMD) reverse transistor
Q8-11			Not Used
Q12	2	2420NPN0	NPN (SMD) (R2) transistor
Q13	2	2420NPN0	NPN (SMD) (R2) transistor
Q14	2	2420NPN0	NPN (SMD) (R2) transistor
Q15	1	2420NPN0	NPN (SMD) (R2) transistor
Q16	1	24005771	2N5771 PNP transistor
Q17	2	2420NPN0	NPN (SMD) (R2) transistor
Q18	2	2420NPN0	NPN (SMD) (R2) transistor
Q19	2	2420NPNR	NPN (SMD) reverse transistor
Q20	2	2420NPNR	NPN (SMD) reverse transistor
Q21	2	2420NPNR	NPN (SMD) reverse transistor
U1	2	30509687	9687OSID Honeywell Comp
U2	2	3510H131	10H131 IC
U3	2	30509687	9687OSID Honeywell Comp

MODEL 755 PART LIST Rev. A

Ident.	Qty.	Part Number	Description
U4	1	3010317T	LM317T TO-220 regulator
U5	1	3010337T	LM337T TO-220 regulator
U6	1	3010337T	LM337T TO-220 regulator
	6	40000016	16 Pin DIP Socket
	40	40100000	Lemo Connector
	40	40100001	Lemo Lock Washer
	32	40100002	Lemo Solder Lug
	40	40100003	Lemo Spanner Nut
	1	40200000	NIM Connector Block
	1	40200001	NIM Connector Shield
	9	40200002	NIM Elect. Pin Male
	2	40200003	NIM Female Guide Pin
	1	40200004	NIM Male Guide Pin
	1	40200005	NIM Male Guide Pin Gold Plate
	1	40200006	#4 Lock Washer Gold Plate
	1	40200007	#4-40 Hex Nut Gold Plate
	2	40950002	Solder Lug
S1	1	50000000	Slide Switch DPDT
	1	58000102	Back Panel
	1	58000103	Right Side Cover
	1	58000104	Left Side Cover
	2	58000105	Square Rail
	2	58000106	Round Rail
	1	58007560	Front Panel
	4	65025603	2-56 x 3/16" Flat Head Phillips Screw
	6	65044003	4-40 x 3/16" Flat Head Phillips Screw
	6	65144006	4-40 x 3/8" Round Head Phillips Screw
	12	65944005	4-40 x 5/16" Round Head Fillister Screw
	3	67004400	4-40 Hex Nut
	3	68000104	#4 Lock Washer
	8	68000500	1/16" Nylon Washer
	4	72000012	3/4" Roll Spacer
	2	73000000	3/16" Rivet
	2	73010000	Stand Off
	2	73010001	Captive Screw
	2	75050001	Heat Sink
	1	85007520	Model 752/755/756 Printed Circuit Board