

MODEL 778 VARIABLE GAIN PREAMPLIFIER

FEATURES

- * Wideband - DC to 200 MHz
- * Variable Gains from 2 to 50
- * Low Noise Performance
- * Excellent DC and Gain Stability
- * 16 Channels in a Single Width NIM
- * Inputs and Outputs protected

Hall A

The Model 778 is a high performance, variable gain preamplifier with 16 channels in a single width NIM module. It is designed to directly operate with detectors producing negative output pulses from DC to over 200 MHz. Each channel has a front panel adjustment providing non-inverting gains from two to fifty and furnishing two outputs, each capable of driving 50 ohm loads.

INPUT CHARACTERISTICS

- Impedance** : 50 ohms $\pm$ 2%, reflections less than $\pm$ 4% for 2 nSec input risetimes.
- Protection** : No damage to the input stage will result from transients of $\pm$ 100 Volts ($\pm$ 2 amps) for 1 uSec or less duration.
- Wideband Noise** : Less than 25 uVolts RMS, referred to the input.
- Input Offset Voltage** : Less than $\pm$ 300 uVolts.
- Overdrive Recovery Time** : Less than 15 nSec for a 1 Volt input.

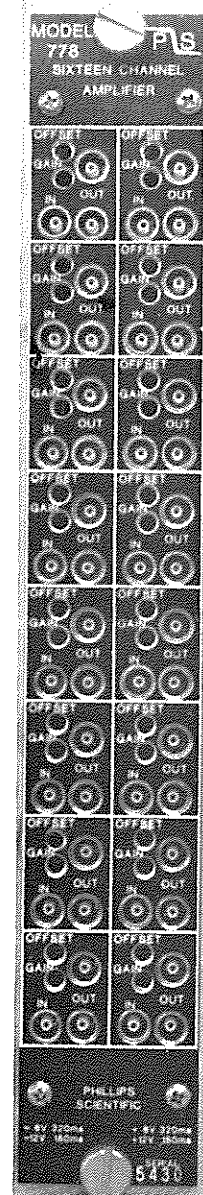
OUTPUT CHARACTERISTICS

- Type** : Two bridged; Voltage source output stage, each output capable of driving a 50 ohm load.
- Output Voltage Swing** : Greater than -3 Volts across 25 ohm load. +.5 Volts across 50 ohm load. +.25 Volts across 25 ohm load.
- Output Protection** : Outputs can be continuously shorted to ground without suffering damage.
- Offset Voltage** : A front panel 15-turn potentiometer allows control of $\pm$ 10 mVolt referred to the input to compensate for offsets due to ground drops or source impedances other than 50 ohms.

GENERAL CHARACTERISTICS

- Gain** : Variable from 2 to 50, non-inverting.
- Stability** : $\pm$ 10 uVolts/ $^{\circ}$ C, referred to the input.
- Linearity** : $\pm$.15% to -3 Volts, DC to 100 MHz.
- Bandwidth** : DC to 200 MHz minimum, 3 db point.
- Risetime** : Less than 1.8 nSec.
- Crosstalk** : Greater than 60 db, DC to 100 MHz.
- Input/Output Delay** : Typically 4.5 nSec.
- Power Supply Requirements** : ** +6 V @ 320 mA +12 V @ 150 mA +24 V @ 85 mA
** -6 V @ 320 mA -12 V @ 150 mA -24 V @ 85 mA

** $\pm$ 6 V requires more current than NIM standard. Phillips Scientific Model 702 NIM power supply is recommended for a full bin of 12 modules.



290ED

Phillips Scientific

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SERIAL NUMBER: 10638

ECO LEVEL: 2001

[illegible]

DATE: 5/27/92

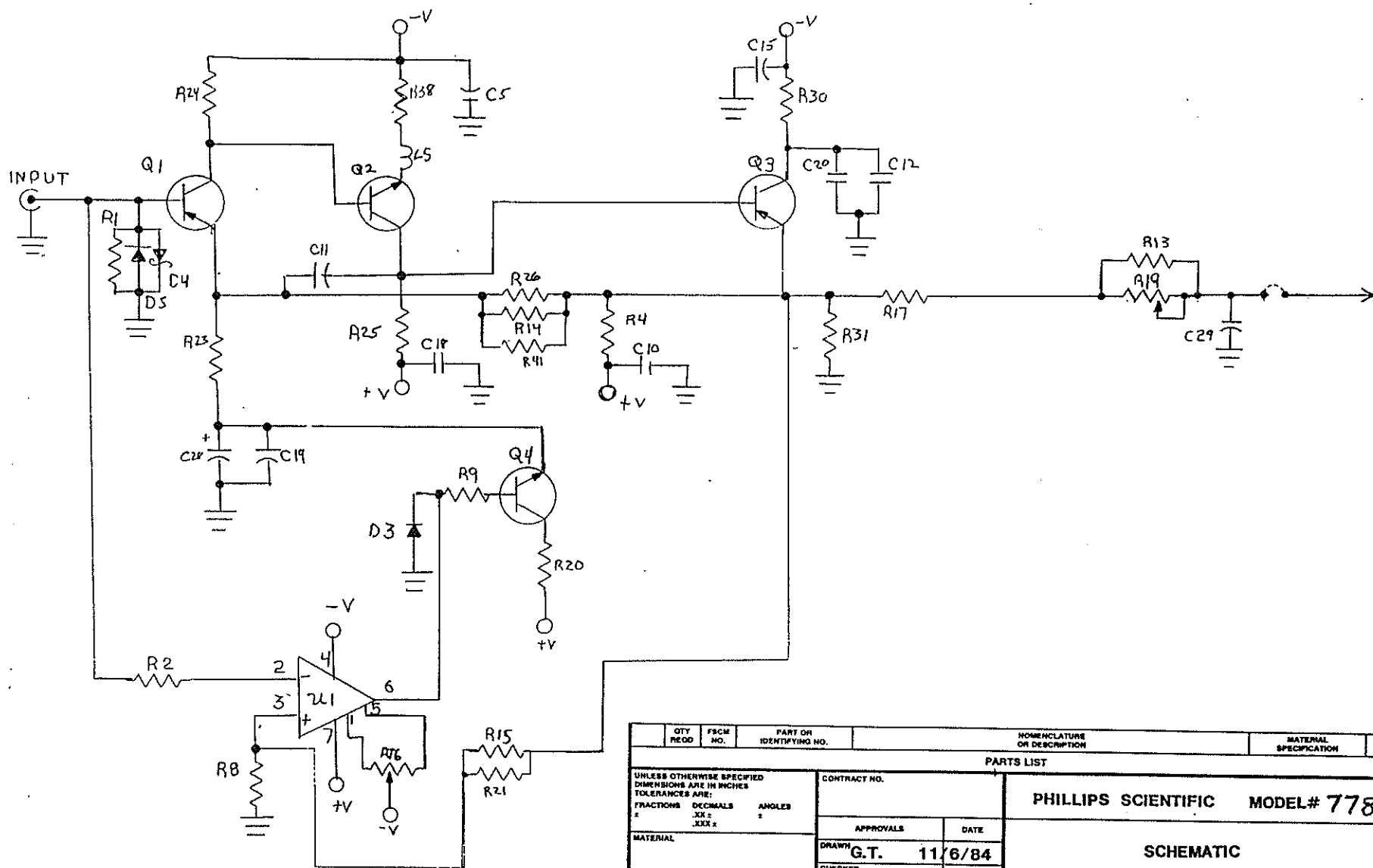
SERIAL NUMBER: 10838

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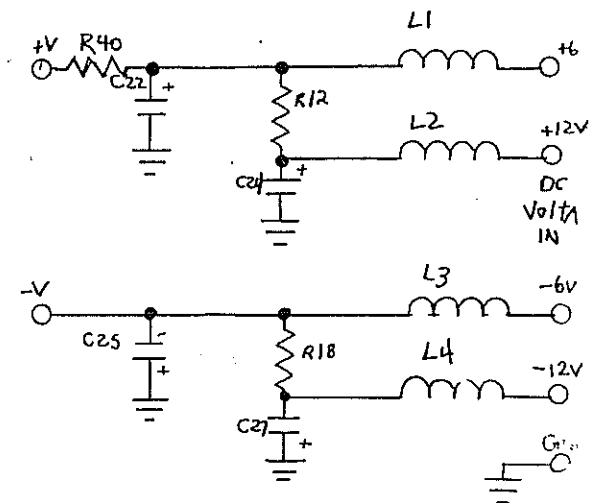
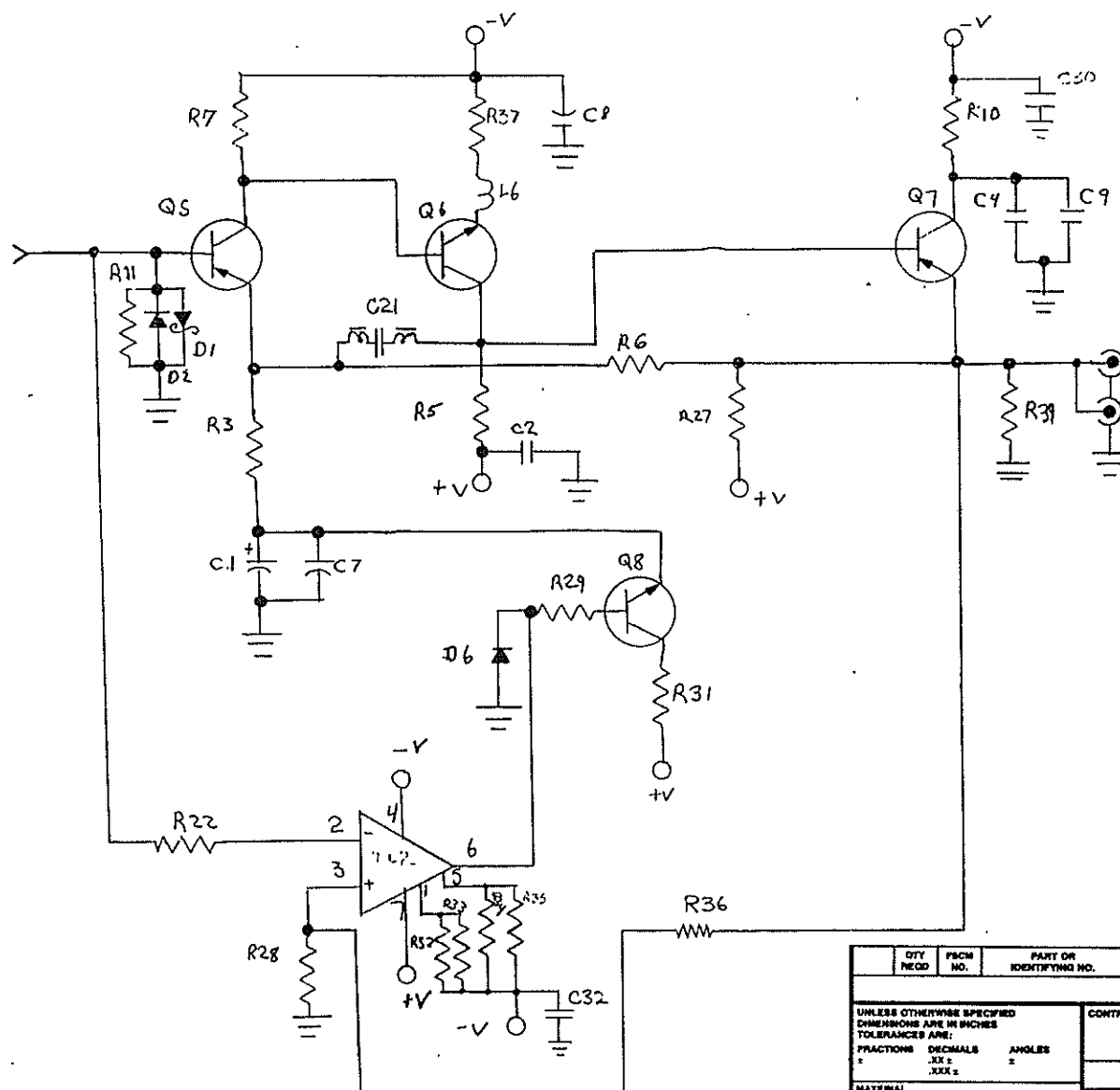
ECO LEVEL: 2001

MODIFICATIONS:

[illegible]



QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± .XXX ± °			CONTRACT NO.	PHILLIPS SCIENTIFIC MODEL# 778
MATERIAL			APPROVALS	DATE
FMSH			CHECKED	
DO NOT SCALE DRAWING			ISSUED	
			SCALE	1001
			DWG. NO.	2367
			REV.	B
			SHEET	1 OF 2



QTY NEED	PSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES " .XX ± .XXX ± °			CONTRACT NO.	
MATERIAL			APPROVALS	DATE
FINISH			CHECKED	DATE
DO NOT SCALE DRAWING			ISSUED	DATE
			PHILLIPS SCIENTIFIC MODEL# 778	
			SCHEMATIC	
			SIZE	FSCM NO.
			DWG. NO.	2368
			REV.	B
			SHEET	2 OF 2

PARTS LIST - MODEL 778 ECO No. 1001

Ident.	Qty.	Part Number	Description
R1	8	006551R1	51.1 ohms 1% RN60D
R2	8	00102401	2.4K ohms 5% CF 1/8
R3	8	002120R0	20 ohms 1% 1/3 watt
R4	8	00104700	470 ohms 5% CF 1/8
R5	8	00106800	680 ohms 5% CF 1/8
R6	8	00212000	200 ohms 1% 1/3 watt
R7	8	00104700	470 ohms 5% CF 1/8
R8	8	00212670	267 ohms 1% 1/3 watt
R9	8	00106801	6.8K 5% CF 1/8
R10	8	001133R0	33 ohms 5% 1/4 watt
R11	8	001051R0	51 ohms 5% CF 1/8
R12	1	003439R0	39 ohms 2 watt Resistor
R13	8		Trim Resistor
R14	8	00212000	200 ohms 1% 1/3 watt
R15	8	00103101	1.3K 5% CF 1/8
R16	8	05101002	10K Potentiometer
R17	8		Trim Resistor
R18	1	003439R0	39 ohms 2 watt
R19	8	05102001	2K Potentiometer
R20	8	001051R0	51 ohms 5% CF 1/8
R21	8		Trim Resistor
R22	8	00102401	2.4K 5% CF 1/8
R23	8	002120R0	20 ohms 1% 1/3 watt
R24	8	00104700	470 ohms 5% CF 1/8
R25	8	00106800	680 ohms 5% CF 1/8
R26	8	00212000	200 ohms 1% 1/3 watt
R27	8	00714700	470 ohms Chip Resistor
R28	8	00212670	267 ohms 1% 1/3 watt
R29	8	00106801	6.8K 5% CF 1/8
R30	8	001133R0	33 ohms 5% 1/4 watt
R31	8	001051R0	51 ohms 5% CF 1/8
R32	8	00105101	5.1K 5% CF 1/8
R33	8		Trim Resistor
R34	8		Trim Resistor
R35	8	00105101	5.1K 5% CF 1/8
R36	8	00212431	2.43K 1% 1/3 watt
R37	8	001022R0	22 ohms 5% CF 1/8
R38	8	001022R0	22 ohms 5% CF 1/8
R39	8	00101000	100 ohms 5% CF 1/8
R40	8	00010250	0 ohms Resistor (Jumper)
R41	8		Trim Resistor
C1	8	10791006	100 mfd @ 3 Volts (Tantlum)
C2	8	10151003	.1 mfd
C3			Not Used
C4	8	10151003	.1 mfd
C5	8	10151003	.1 mfd

PARTS LIST - MODEL 778 ECO No. 1001

Ident.	Qty.	Part Number	Description
C6			Not Used
C7	8	10151003	.1 mfd
C8	8	10151003	.1 mfd
C9	8	10153303	.33 mfd Ceramic Mono.
C10	8	10151003	.1 mfd
C11	8	10103P00	3 pfd NPO Ceramic Disk
C12	8	10151003	.1 mfd
C13			Not Used
C14			Not Used
C15	8	10151003	.1 mfd
C16			Not Used
C17	8	10123P30	3.3 pfd Ceramic Chip
C18	8	10151003	.1 mfd
C19	8	10151003	.1 mfd
C20	8	10153303	.33 mfd Ceramic Mono.
C21	8	10101P00	1.0 pfd NPO Ceramic Disk
C22	3	10614706	470 mfd @ 10V
C23			Not Used
C24	3	10522206	220 mfd @ 16V
C25	3	10614706	470 mfd @ 10V
C26			Not Used
C27	3	10522206	220 mfd @ 16V
C28	8	10791006	100 mfd @ 3 Volts (Tantalum)
C29	8	10108P00	8 pfd NPO Ceramic Disk
C30	8	10121001	1000 pfd Chip Capacitor
C31			Not Used
C32	8	10151003	.1 mfd
D1	8	20202835	2835 Schottky Diode
D2	8	20004448	1N4448 Diode
D3	8	20004448	1N4448 Diode
D4	8	20202835	2835 Schottky Diode
D5	8	20004448	1N4448 Diode
D6	8	20004448	1N4448 Diode
L1	1	15000000	Power Inductor
L2	1	15000000	Power Inductor
L3	1	15000000	Power Inductor
L4	1	15000000	Power Inductor
L5	8	14000000	Large Bead
L6	8	14000000	Large Bead
U1	8	3020F411	LF411CN
U2	8	3020F411	LF411CN

PARTS LIST - MODEL 778 ECO No. 1001

Ident.	Qty.	Part Number	Description
Q1	8	2420T92R	BFT92R SOT-23 Transistor
Q2	8	2420R92R	BFR92R SOT-23 Transistor
Q3	8	2420T93R	BFT93R SOT-23 Transistor
Q4	8	24003904	2N3904 Transistor
Q5	8	2420T92R	BFT92R SOT-23 Transistor
Q6	8	2420R920	BFR92 SOT-23 Transistor
Q7	8	2421Q320	BFQ32 SOT-37 Transistor
Q8	8	24003904	2N3904 Transistor
	16	40000008	8 Pin DIP Socket
	24	40100000	RF Connector
	24	40100001	Lock Washer
	16	40100002	Solder Lug
	24	40100003	Spanner Nut
	8	40100004	Shield
	1	40200000	NIM Connector Block
	1	40200001	NIM Connector Shield
	5	40200002	NIM Elect. Pin
	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
	1	40950002	Solder Lug
	1	58000102	Back Panel
	1	58000103	Right Side Cover
	1	58000104	Left Side Cover
	2	58000105	Square Rail
	2	58000106	Round Rail
	1	58007770	Front Panel
	4	65025603	2-56 x 3/16" Flat Head Screw
	6	65044003	4-40 x 3/16" Flat Head Screw Undercut
	6	65144006	4-40 x 3/8" Round Head Phillips Screw
	6	65944004	4-40 x 1/4" Fillister Head Screw
	2	73010000	Stand Off
	2	73010001	Captive Screw
	1	85007770	Model 777 Printed Circuit Board