

# Phillips Scientific

## 16 Channel Logic Level Translator

## NIM MODEL 726

### FEATURES

- \* Converts TTL, NIM and ECL Logic Families
- \* High Density - 16 Independent Channels
- \* DC - 150 MHz for NIM and ECL Translation
- \* DC - 100 MHz for TTL Translation
- \* Low Power - Meets Requirements for Single NIM Slot
- \* Available in CAMAC Packaging Model 7126

### DESCRIPTION

The model 726 is a 16-channel level translator packaged in a single width NIM module. It simultaneously converts in any direction between NIM, TTL and ECL logic families. In addition, a logical "OR" is possible for the ECL input and the NIM/TTL input. The input to output is direct coupled with the output duration equal to the input duration. Each channel has a single input connector which accepts a fast negative NIM level with 50 ohm input impedance and a positive TTL level with 1000 ohms impedance. This produces a positive TTL output capable of driving a 50 ohm load and a bridged NIM output that drives two 50 ohm loads. The NIM output stage is current-switching which allows pulse clipping and is protected from damage due to shorted cables.

### INPUT CHARACTERISTICS

**NIM/TTL** : 16 inputs, one per channel, LEMO style connector; accepts both negative NIM or positive TTL pulses or levels.

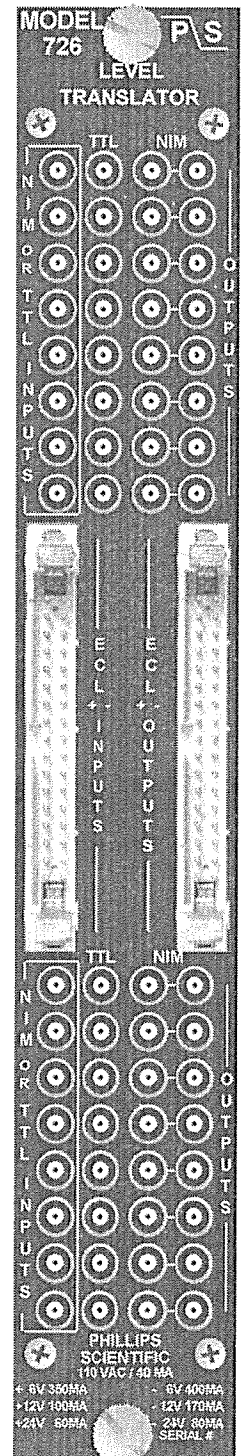
NIM: 50 ohms impedance  $\pm 10\%$ ; -500mV threshold; input protected to  $\pm 8$  VDC.

TTL: 1000 ohms impedance  $\pm 10\%$ ; +1.2Volt threshold; input protected to  $\pm 8$  VDC.

**ECL Input** : 16 inputs, one per channel; 2 x 17 pin header with lock and eject feature; accepts complementary ECL inputs; removable 110 ohm input termination; 200mV differential threshold.

### OUTPUT CHARACTERISTICS

**NIM Outputs** : Two NIM outputs per channel; bridged -32mA current switching, LEMO style connectors; delivers one double amplitude NIM level or two normal NIM levels into 50 ohms; 1.5 nSec rise and fall times.



**Phillips Scientific**

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

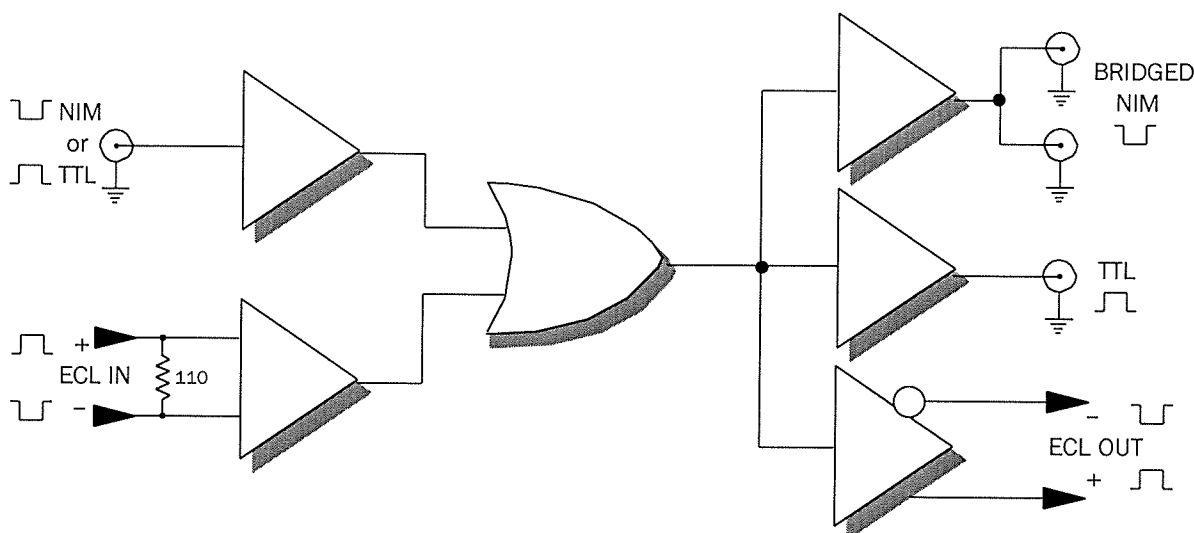
## OUTPUT CHARACTERISTICS (continued)

- TTL Output** : One TTL output per channel, LEMO style connector; sources 45mA to drive 50 ohm load or 1000 standard TTL loads, sink current of 100mA; able to drive 100 standard TTL loads. 3.5nSec rise and fall times.
- ECL Output** : Complementary ECL, one per channel; 2 x 17 pin header with lock and eject feature; drives two 110 ohm ECL loads or up to 30 daisy-chained loads. Normal ECL levels of -800mV and -1.7Volts, 2nSec rise and fall times.

## GENERAL PERFORMANCE

- Rate** : DC to 150 MHz for NIM and ECL translation;  
DC to 100 MHz for TTL translation.
- Minimum Pulse Widths** : 4nSec for NIM and ECL translation;  
7nSec for TTL translation.
- Insertion Delay** : NIM, TTL or ECL input to NIM or ECL output = 5nSec.  
NIM, TTL or ECL input to TTL output = 10nSec.
- Power Requirements** : + 6 V @ 350 mA      - 6 V @ 400 mA  
+12 V @ 100 mA      -12 V @ 170 mA  
+24 V @ 60 mA      -24 V @ 80 mA  
110 VAC @ 40 mA
- Operating Temp.** : 0 °C to 70 °C ambient.
- Packaging** : Standard single width NIM module in accordance with TID-20893 (Rev). and Section ND-524.

## BLOCK DIAGRAM OF ONE CHANNEL



12/03

## MODEL 726 SIXTEEN CHANNEL LOGIC LEVEL TRANSLATOR

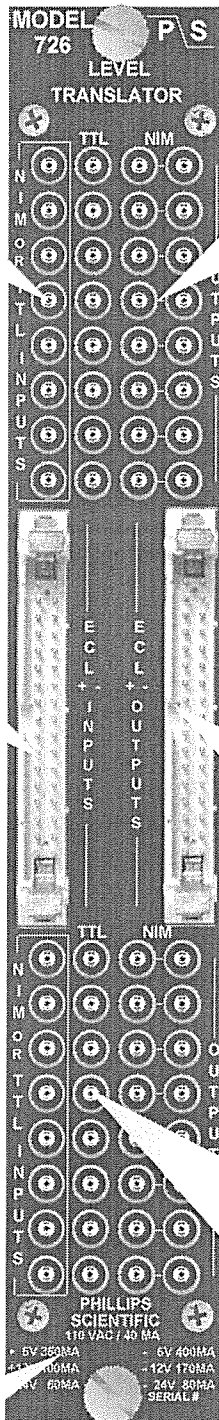
( Front Panel Description )

Standard # 1 NIM Packaging  
in accordance with TID-20893

16 Logic Level LEMO Inputs;  
Negative NIM or Positive TTL;  
NIM=50 ohm, TTL=500 ohm.

16 Differential ECL Inputs;  
110 ohm Input Impedance,  
Logic OR'D with LEMO Inputs;

NIM Voltage and Current  
Requirements

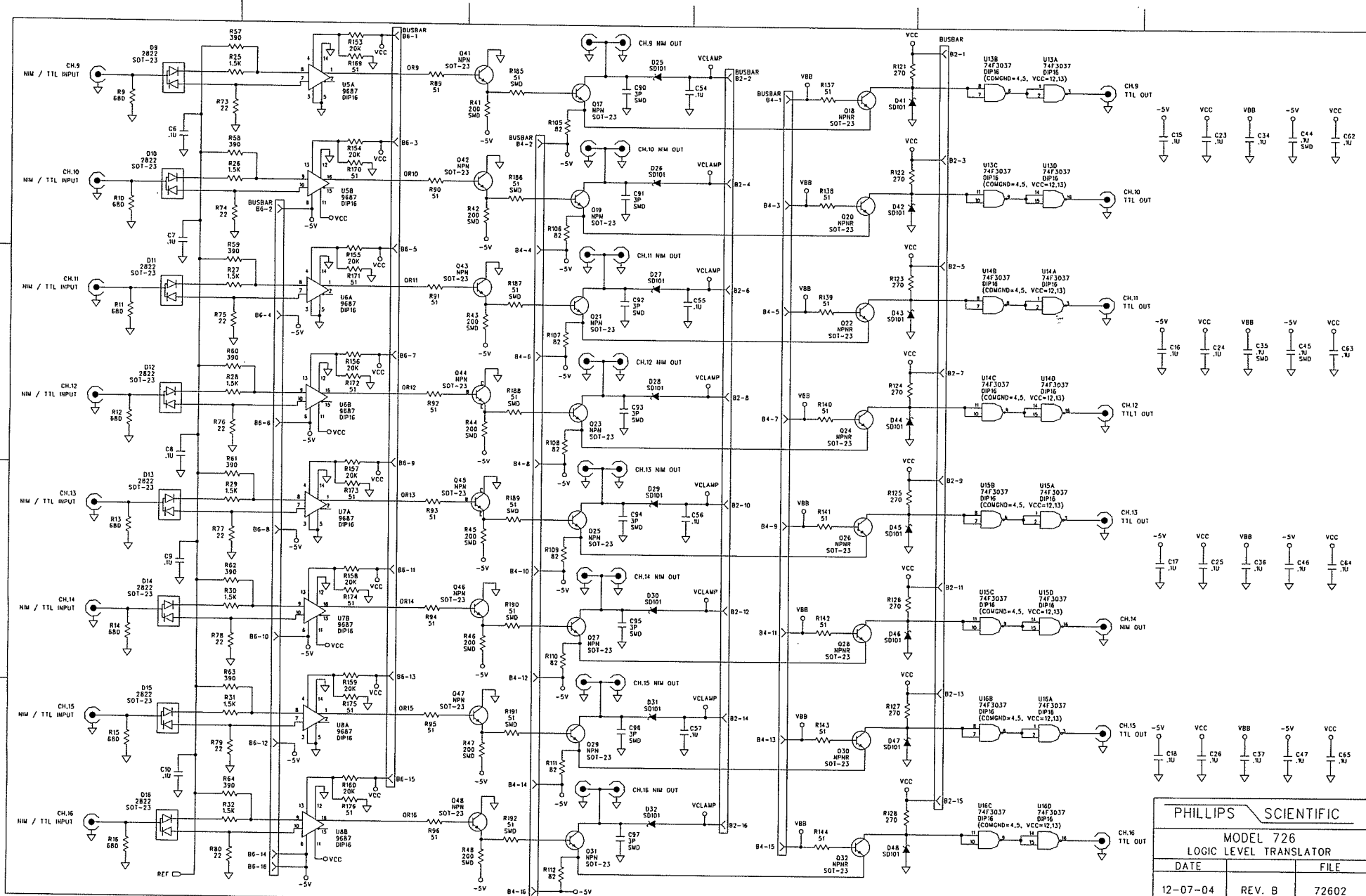


Double-Amplitude Bridged NIM Out;  
-32mA (-1.6 Volts into 50 ohms,  
-8 Volt into Two 50 ohm Loads)

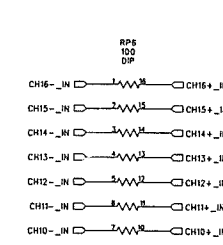
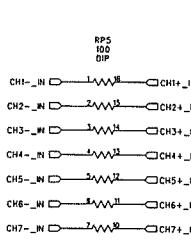
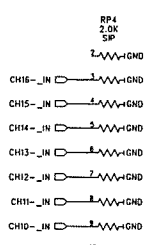
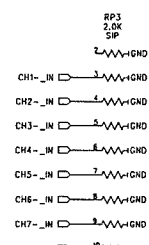
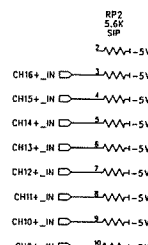
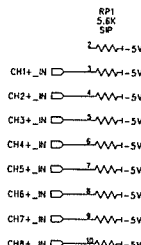
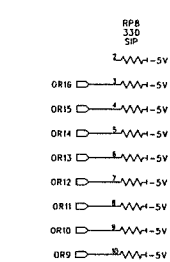
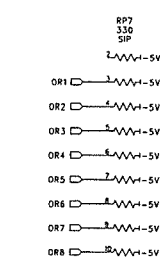
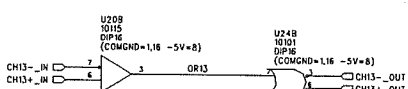
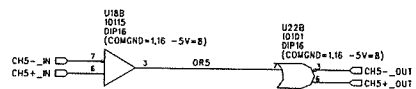
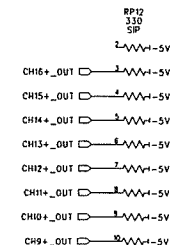
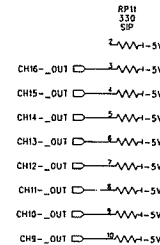
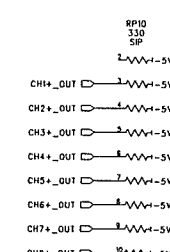
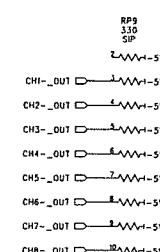
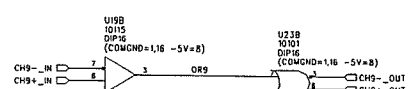
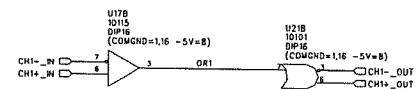
16 Differential ECL Outputs;  
34 Position Header; Can Drive  
Two 100 ohm Twisted Pair Cables.

16 TTL Outputs, LEMO Connector;  
Capable of Driving 2 Volts into 50 ohms  
or 100 Standard TTL Loads.

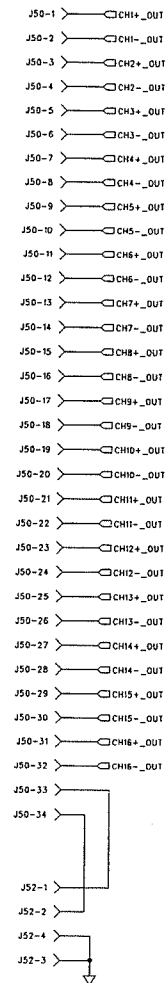
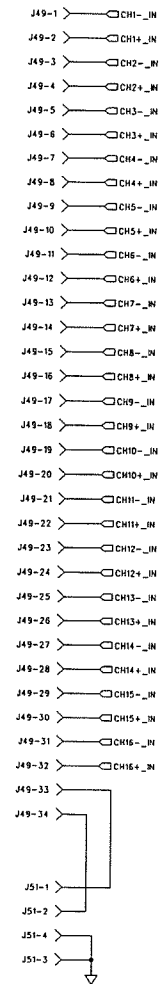




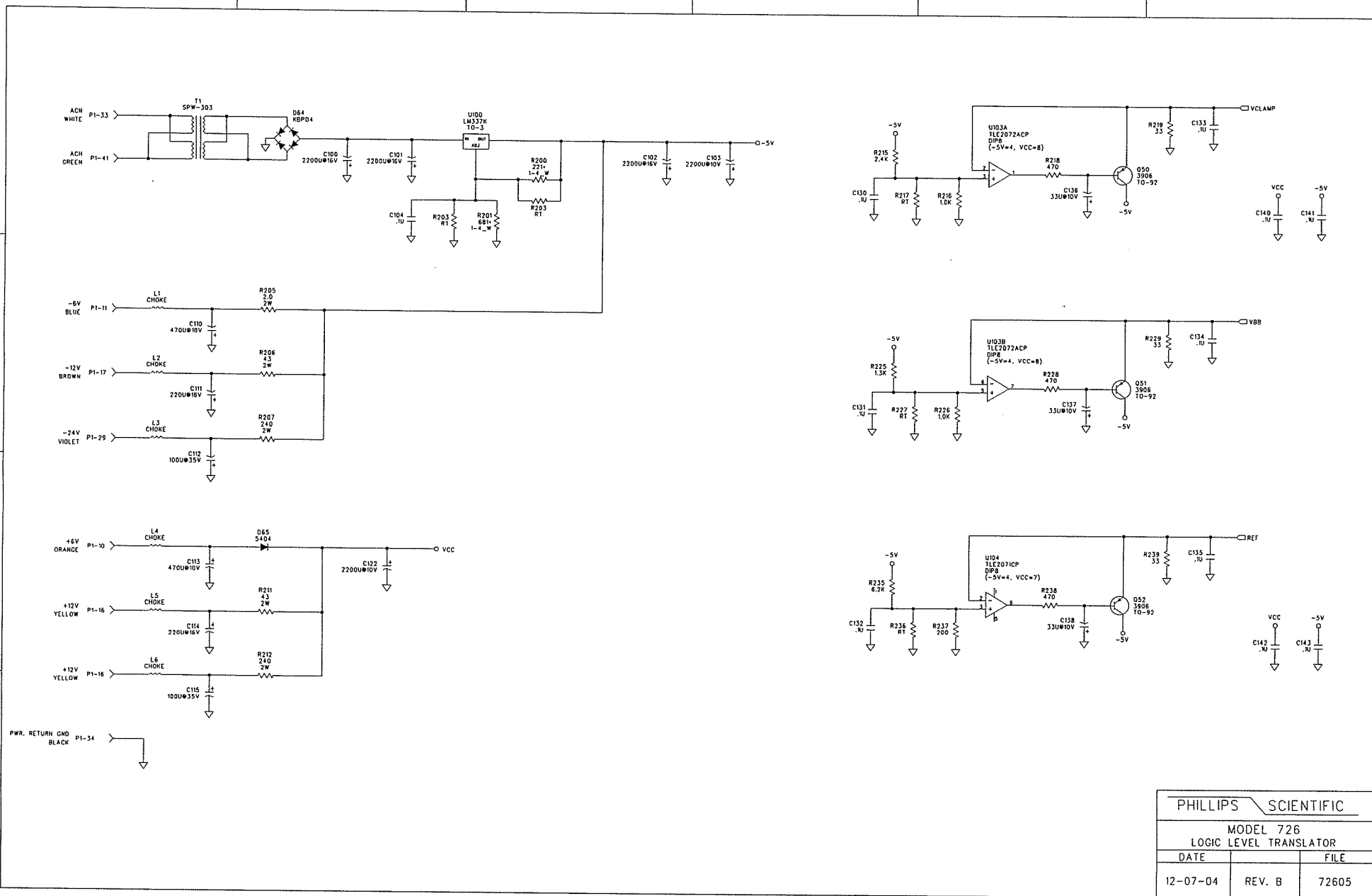
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|------------------------|--------|-------|
| MODEL 726              |        |       |
| LOGIC LEVEL TRANSLATOR |        |       |
| DATE                   | REV. B | FILE  |
| 12-07-04               | REV. B | 72602 |



| PHILLIPS SCIENTIFIC    |        |       |
|------------------------|--------|-------|
| MODEL 726              |        |       |
| LOGIC LEVEL TRANSLATOR |        |       |
| DATE                   | REV. B | FILE  |
| 12-07-04               | REV. B | 72603 |



|                        |        |       |
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| PHILLIPS SCIENTIFIC    |        |       |
| MODEL 726              |        |       |
| LOGIC LEVEL TRANSLATOR |        |       |
| DATE                   |        | FILE  |
| 12-07-04               | REV. 8 | 72604 |



| PHILLIPS SCIENTIFIC    |        |       |
|------------------------|--------|-------|
| MODEL 726              |        |       |
| LOGIC LEVEL TRANSLATOR |        |       |
| DATE                   | FILE   |       |
| 12-07-04               | REV. B | 72605 |

## MODEL 726 PARTS LIST

Rev. C

| <u>Ident.</u> | <u>Qty.</u> | <u>Part Number</u> | <u>Description</u>          |
|---------------|-------------|--------------------|-----------------------------|
| R1-16         | 16          | 00106800           | 680 ohm 5% CF 1/8 resistor  |
| R17-32        | 16          | 00101501           | 1.5K ohm 5% CF 1/8 resistor |
| R33-48        | 16          | 00712000           | 200 ohm 5% SMD 1/8 resistor |
| R49-64        | 16          | 00103900           | 390 ohm 5% CF 1/8 resistor  |
| R65-80        | 16          | 001022R0           | 22 ohm 5% CF 1/8 resistor   |
| R81-96        | 16          | 001051R0           | 51 ohm 5% CF 1/8 resistor   |
| R97-112       | 16          | 001082R0           | 82 ohm 5% CF 1/8 resistor   |
| R113-128      | 16          | 00102700           | 270 ohm 5% CF 1/8 resistor  |
| R129-144      | 16          | 001051R0           | 51 ohm 5% CF 1/8 resistor   |
| R145-160      | 16          | 00102002           | 20K ohm 5% CF 1/8 resistor  |
| R161-176      | 16          | 001051R0           | 51 ohm 5% CF 1/8 resistor   |
| R177-192      | 16          | 007151R0           | 51 ohm 5% SMD 1/8 resistor  |
| R193-199      |             |                    | Not Used                    |
| R200          | 1           | 00652210           | 221 ohm 1% RN 1/4 resistor  |
| R201          | 1           | 00656810           | 681 ohm 1% RN 1/4 resistor  |
| R202          |             |                    | Not Used                    |
| R203          | 1           | 00000000           | Resistor Trim               |
| R204          |             |                    | Not Used                    |
| R205          | 1           | 00342R00           | 2.0 ohm 5% MOF 2W resistor  |
| R206          | 1           | 003443R0           | 43 ohm 5% MOF 2W resistor   |
| R207          | 1           | 00342400           | 240 ohm 5% MOF 2W resistor  |
| R208-210      |             |                    | Not Used                    |
| R211          | 1           | 003443R0           | 43 ohm 5% MOF 2W resistor   |
| R212          | 1           | 00342400           | 240 ohm 5% MOF 2W resistor  |
| R213-214      |             |                    | Not Used                    |
| R215          | 1           | 00102401           | 2.4K ohm 5% CF 1/8 resistor |
| R216          | 1           | 00101001           | 1.0K ohm 5% CF 1/8 resistor |
| R217          | 1           | 00000000           | Resistor Trim               |
| R218          | 1           | 00104700           | 470 ohm 5% CF 1/8 resistor  |
| R219          | 1           | 001033R0           | 33 ohm 5% CF 1/8 resistor   |
| R220-224      |             |                    | Not Used                    |
| R225          | 1           | 00101301           | 1.3K ohm 5% CF 1/8 resistor |
| R226          | 1           | 00101001           | 1.0K ohm 5% CF 1/8 resistor |
| R227          | 1           | 00000000           | Resistor Trim               |
| R228          | 1           | 00104700           | 470 ohm 5% CF 1/8 resistor  |
| R229          | 1           | 001033R0           | 33 ohm 5% CF 1/8 resistor   |
| R230-234      |             |                    | Not Used                    |
| R235          | 1           | 00106201           | 6.2K ohm 5% CF 1/8 resistor |
| R236          | 1           | 00000000           | Resistor Trim               |
| R237          | 1           | 00102000           | 200 ohm 5% CF 1/8 resistor  |
| R238          | 1           | 00104700           | 470 ohm 5% CF 1/8 resistor  |
| R239          | 1           | 001033R0           | 33 ohm 5% CF 1/8 resistor   |
| RP1-2         | 2           | 00805601           | 5.6K ohm SIP resistor       |
| RP3-4         | 2           | 00802001           | 2.0K ohm SIP resistor       |
| RP5-6         | 2           | 00931000           | 100 ohm DIP resistor        |
| RP7-12        | 6           | 00803300           | 330 ohm SIP resistor        |
| C1-32         | 32          | 10151003           | .1 mfd cer mono capacitor   |
| C33           | 1           | 10121003           | .1 mfd SMD cer capacitor    |
| C34           | 1           | 10151003           | .1 mfd cer mono capacitor   |
| C35           | 1           | 10121003           | .1 mfd SMD cer capacitor    |
| C36-37        | 2           | 10151003           | .1 mfd cer mono capacitor   |
| C38-39        |             |                    | Not Used                    |
| C40-42        | 3           | 10151003           | .1 mfd cer mono capacitor   |
| C43-45        | 3           | 10121003           | .1 mfd SMD cer capacitor    |

## MODEL 726 PARTS LIST

Rev. C

| <u>Ident.</u> | <u>Qty.</u> | <u>Part Number</u> | <u>Description</u>                |
|---------------|-------------|--------------------|-----------------------------------|
| C46-47        | 2           | 10151003           | .1 mfd cer mono capacitor         |
| C48-49        |             |                    | Not Used                          |
| C50-65        | 16          | 10151003           | .1 mfd cer mono capacitor         |
| C66-69        |             |                    | Not Used                          |
| C70-77        | 8           | 10151003           | .1 mfd cer mono capacitor         |
| C78-79        |             |                    | Not Used                          |
| C80-81        | 2           | 10823305           | 33 mfd @ 10v tan capacitor        |
| C82-97        | 16          | 10123P00           | 3 pfd SMD cer capacitor           |
| C98-99        |             |                    | Not Used                          |
| C100-102      | 3           | 10622207           | 2200 mfd @ 16v al el capacitor    |
| C103          | 1           | 10612207           | 2200 mfd @ 10v al el capacitor    |
| C104          | 1           | 10151003           | .1 mfd cer mono capacitor         |
| C105-109      |             |                    | Not Used                          |
| C110          | 1           | 10522206           | 470 mfd @ 10v al el capacitor     |
| C111          | 1           | 10622206           | 220 mfd @ 16v al el capacitor     |
| C112          | 1           | 10541006           | 100 mfd @ 35v al el capacitor     |
| C113          | 1           | 10522206           | 470 mfd @ 10v al el capacitor     |
| C114          | 1           | 10622206           | 220 mfd @ 16v al el capacitor     |
| C115          | 1           | 10541006           | 100 mfd @ 35v al el capacitor     |
| C116-121      |             |                    | Not Used                          |
| C122          | 1           | 10612207           | 2200 mfd @ 10v al el capacitor    |
| C123-129      |             |                    | Not Used                          |
| C130-135      | 6           | 10151003           | .1 mfd cer mono capacitor         |
| C136-138      | 3           | 10813305           | 33 mfd @ 10v tan capacitor        |
| C139          |             |                    | Not Used                          |
| C140-143      | 4           | 10151003           | .1 mfd cer mono capacitor         |
| D1-16         | 16          | 20052822           | HSMS2822 T30 SMD diode pair       |
| D17-48        | 32          | 2020101C           | SD101 Schottky diode              |
| D64           | 1           | 2030BL06           | KBL06 Bridge Rectifier            |
| D65           | 1           | 20005404           | 1N5404 diode                      |
| Q1, 3 ... 31  | 16          | 2420NPN0           | NPN (SMD) (R2) transistor         |
| Q2, 4 ... 32  | 16          | 2420PNR            | NPN (SMD) (R2) reverse transistor |
| Q33-48        | 16          | 2420NPN0           | NPN (SMD) (R2) transistor         |
| Q50-52        | 3           | 24203906           | 2N3906 PNP TO-92 transistor       |
| L1-6          | 6           | 15000000           | Power Inductor                    |
| U1-8          | 8           | 30509687           | SPT9687SIN Honeywell Comp IC      |
| U9-16         | 8           | 32F03037           | 74F3037N IC                       |
| U17-24        | 4           | 3510115P           | MC10115P IC                       |
| U21-24        | 4           | 3510101P           | MC10101P IC                       |
| U25-99        |             |                    | Not Used                          |
| U100          | 1           | 3010337K           | LM337K TO-3 regulator             |
| U101-102      |             |                    | Not Used                          |
| U103          | 1           | 30202072           | TLE2072ACP IC                     |
| U104          | 1           | 30202071           | TLE2071CP IC                      |
| T1            | 1           | 15500004           | SPW-303 Power Transformer         |

## MODEL 726 PARTS LIST

Rev. C

| <u>Ident.</u> | <u>Qty.</u> | <u>Part Number</u> | <u>Description</u>                        |
|---------------|-------------|--------------------|-------------------------------------------|
| J1-9          | 9           | 00100000           | 0 ohm 5% CF 1/8 resistor                  |
|               | 2           | 40000008           | 8 Pin DIP Socket                          |
|               | 26          | 40000016           | 16 Pin DIP Socket                         |
|               | 64          | 40100007           | Lemo PC Mt. connector                     |
|               | 1           | 40200000           | NIM Connector Block                       |
|               | 1           | 40200001           | NIM Connector Shield                      |
|               | 9           | 40200002           | NIM Elect. Pins                           |
|               | 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                  |
| J51-52        | 2           | 40302002           | DR 2x2 header                             |
|               | 1           | 40302034           | DR 2x17 header                            |
|               | 2           | 40310034           | 34 pin socket connector                   |
| J49-50        | 2           | 40323434           | 34 pin walled header                      |
|               | 1           | 40950002           | Solder Lug                                |
| B1-6          | 6           | 48072601           | 726 Bus Bar                               |
|               | 1           | 49010001           | 6" 34 conduct. flat cable                 |
|               | 1           | 58000102           | Back Panel                                |
|               | 1           | 58000103           | Right Side Cover                          |
|               | 1           | 58000104           | Left Side Cover                           |
|               | 2           | 58000105           | Square Rail                               |
|               | 2           | 58000106           | Round Rail                                |
|               | 1           | 58007260           | Front Panel                               |
|               | 4           | 65025603           | 2-56 x 3/16" Phillips Flat Head Screw     |
|               | 6           | 65044003           | 4-40 x 3/16" Phillips Flat Head Screw     |
|               | 6           | 65144006           | 4-40 x 3/8" Phillips Round Head Screw     |
|               | 8           | 65944005           | 4-40 x 5/16" Slotted Fillister Head Screw |
|               | 2           | 73010000           | Stand Off                                 |
|               | 2           | 73010001           | Captive Screw                             |
|               | 1           | 85007260           | Model 726/7126 Rev. C Printed Circuit Bd. |
|               | 2           | 85007261           | Model 726-1/7126-1 Printed Circuit Bd.    |