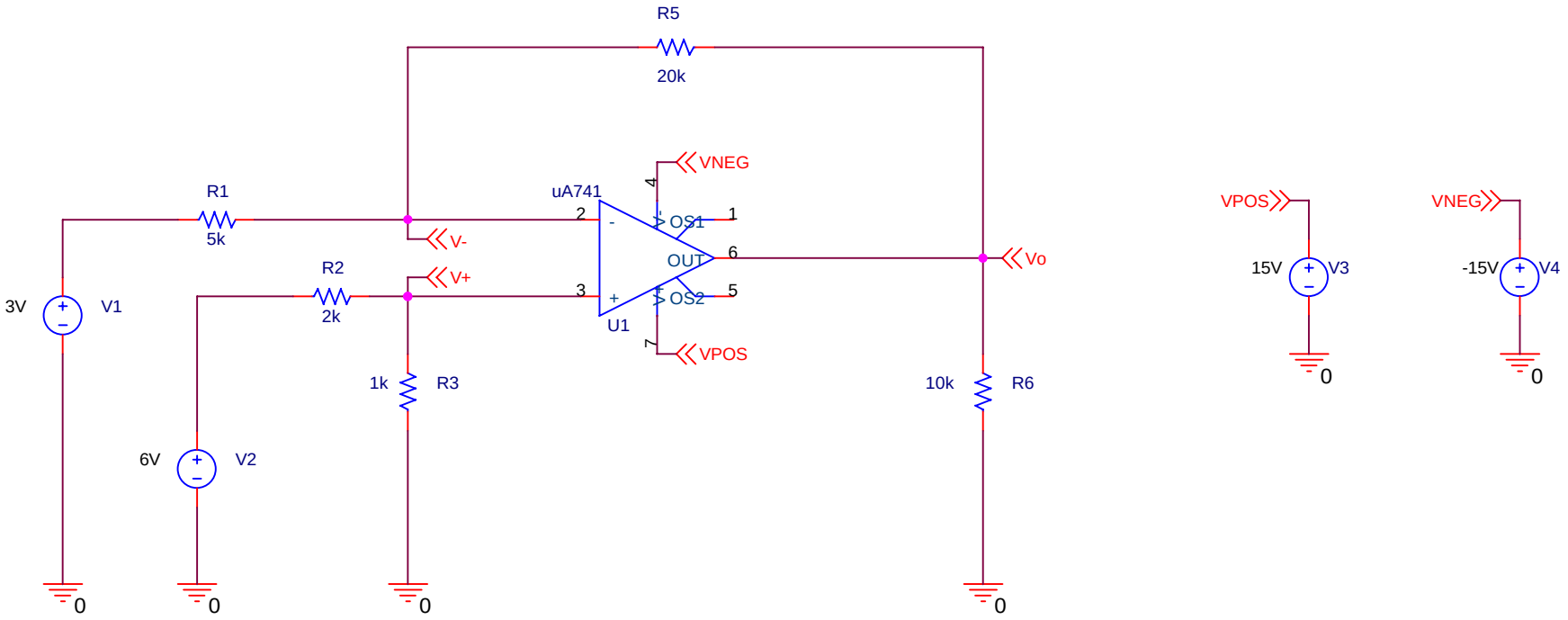
EGR 260
Circuit Analysis
File: OpAmp741.opj

Operational Amplifier Circuit using a Library Model (uA741)

Purpose: Analysis of the op-amp circuit shown on the following page yields Vo = -2V. Use PSPICE to analyze the circuit using the uA741 op amp from the EVAL library.

Analysis: Since only the output node voltage Vo is needed, a bias point analysis will be used.



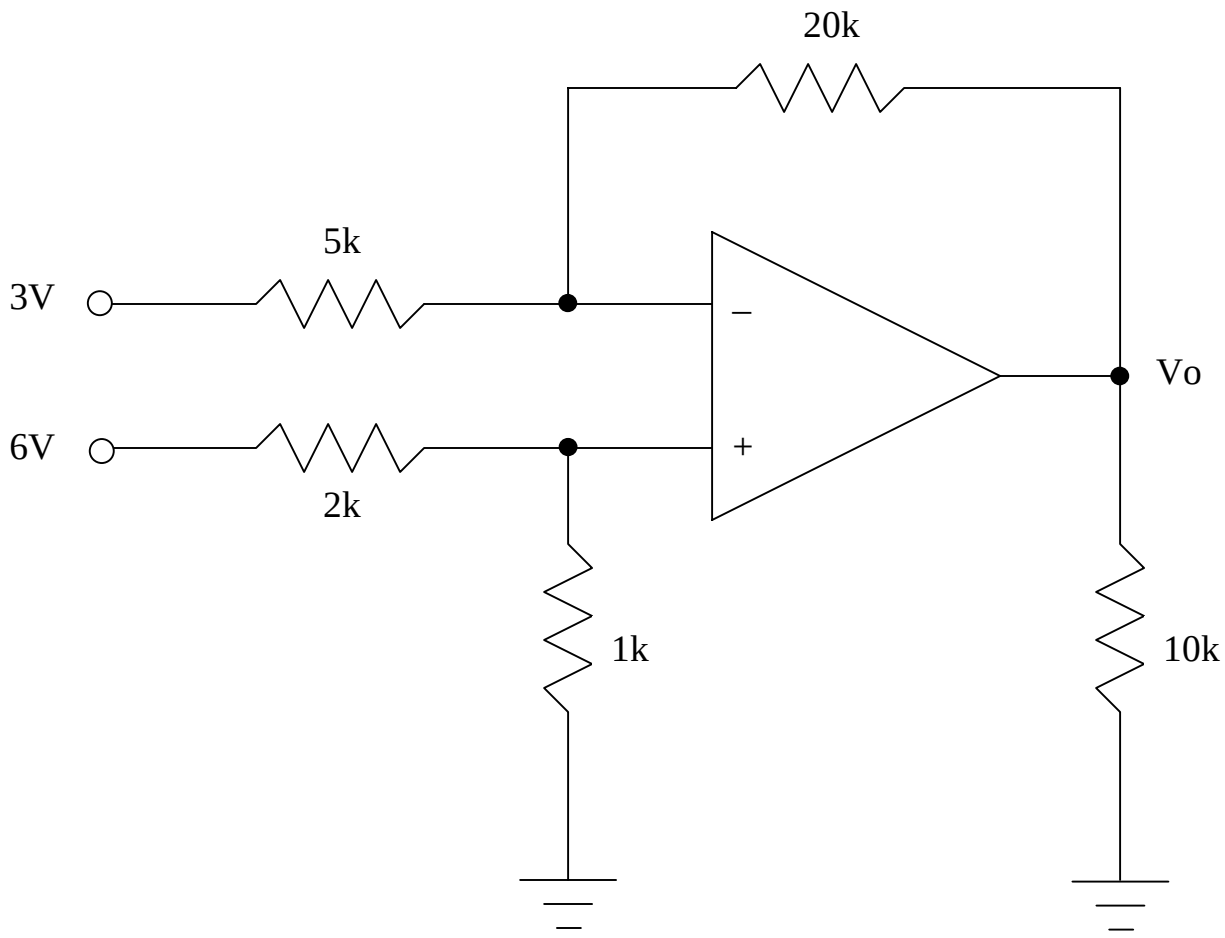
Notes:

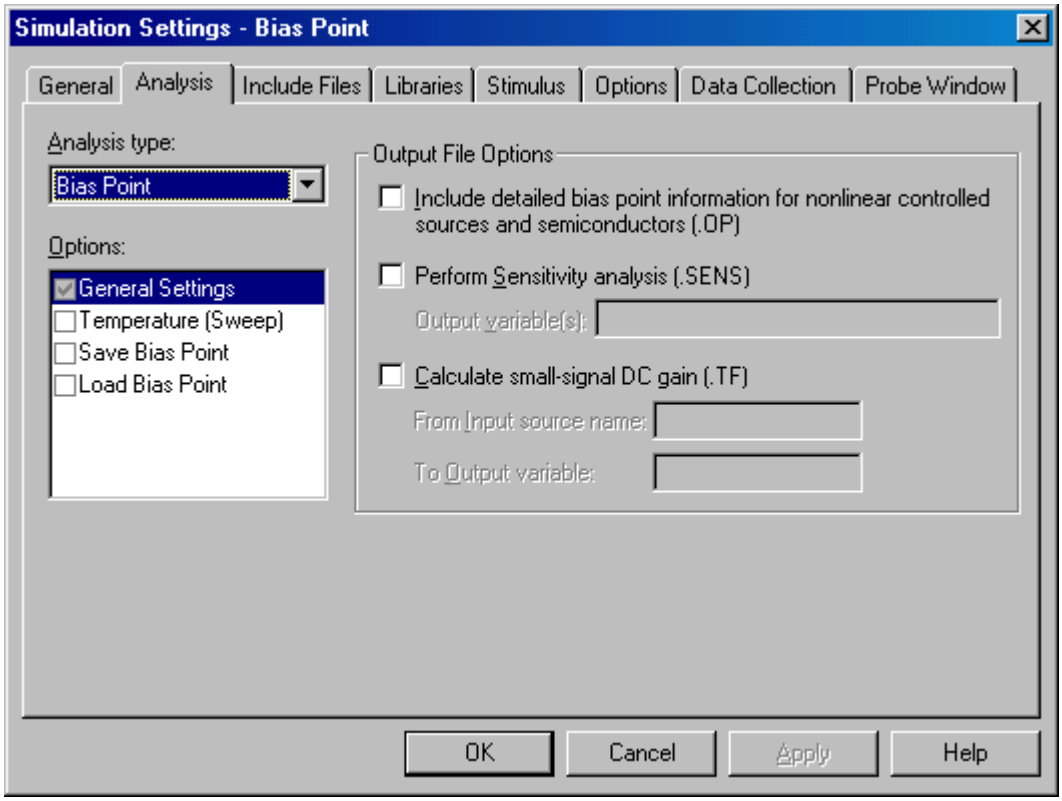
1) Pins 1 and 5 on the uA741 op amp are unnecessary for this example.

2) OFFPAGE symbols were connected to the positive and negative supply voltage pins on the op amp instead of connecting the supplies VPOS and VNEG directly. This is not necessary, but is often convenient for simplifying schematics and for multi-page schematics.

3) The uA741 is a commonly available op amp. The professional version of ORCAD has an op amp library with hundreds of commercially-available op amps to choose from.

Title <Title>		
Size A	Document Number <Doc>	Rev <RevCode>
Date: Saturday, February 12	Sheet 1 of 1	


20k
5k
3V
6V
2k
1k
10k
Vo
–
+


Simulation Settings - Bias Point
General
Analysis
Include Files
Libraries
Stimulus
Options
Data Collection
Probe Window
Analysis type:
Bias Point
Options:
General Settings
Temperature (Sweep)
Save Bias Point
Load Bias Point
Output File Options
Include detailed bias point information for nonlinear controlled sources and semiconductors (.OP)
Perform Sensitivity analysis (.SENS)
Output variable(s):
Calculate small-signal DC gain (.TF)
From Input source name:
To Output variable:
OK
Cancel
Apply
Help

```
**** 02/12/ 19:40:58 ********** Evaluation PSpice  **************

 ** circuit file for profile: Bias Point

 ****     CIRCUIT DESCRIPTION

*******************************************************************************

** WARNING: THIS AUTOMATICALLY GENERATED FILE MAY BE OVERWRITTEN BY SUBSEQUENT
PROFILES

*Libraries:
* Local Libraries :
* From [PSPICE NETLIST] section of pspiceev.ini file:
.lib nom.lib

*Analysis directives:
.PROBE
.INC "opamp741-SCHEMATIC1.net"

**** INCLUDING opamp741-SCHEMATIC1.net ****
* source OPAMP741
V_V2         N00117 0 DC 6V AC 1Vac
R_R1         N00123 V-  5k
R_R2         N00117 V+  2k
R_R3         0 V+  1k
R_R5         VO V-  20k
V_V1         N00123 0 DC 3V AC 1Vac
R_R6         0 VO  10k
X_U1         V+ V- VPOS VNEG VO uA741
V_V3         VPOS 0 DC 15V AC 1Vac
V_V4         VNEG 0 DC -15V AC 1Vac

.END

**** 02/12/ 19:40:58 ********** Evaluation PSpice  **************

 ** circuit file for profile: Bias Point

 ****     SMALL SIGNAL BIAS SOLUTION       TEMPERATURE =   27.000 DEG C

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 NODE   VOLTAGE     NODE   VOLTAGE     NODE   VOLTAGE     NODE   VOLTAGE

(   V+)    1.9999  (   V-)    1.9999  (   VO)   -1.9988  ( VNEG)  -15.0000

                                          So  Vo = -1.9988V

( VPOS)   15.0000  (N00117)    6.0000 (N00123)    3.0000 (X_U1.6) 222.5E-06

(X_U1.7)   -2.1165 (X_U1.8)   -2.1165 (X_U1.9)    0.0000 (X_U1.10)    1.3919

(X_U1.11)   14.9600                  (X_U1.12)   14.9600
(X_U1.13)    1.4059                  (X_U1.14)    1.4059
(X_U1.53)   14.0000                  (X_U1.54)  -14.0000
(X_U1.90)   -2.3529                  (X_U1.91)   40.0000
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```
(X_U1.92)  -40.0000                  (X_U1.99)    0.0000

    VOLTAGE SOURCE CURRENTS
    NAME         CURRENT

    V_V2        -2.000E-03
    V_V1        -2.000E-04
    V_V3        -1.667E-03
    V_V4         1.667E-03
    X_U1.vb      2.225E-09
    X_U1.vc      1.600E-11
    X_U1.ve      1.200E-11
    X_U1.vlim   -2.353E-03
    X_U1.vlp    -4.235E-11
    X_U1.vln    -3.765E-11

    TOTAL POWER DISSIPATION   6.26E-02  WATTS

          JOB CONCLUDED
          TOTAL JOB TIME            .35
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