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Richman, D.M., Lindauer, S.E., _____, McKerchar, T, & Morse, P. (2001).
Functional analysis and treatment of breathholding mediated by nonsocial reinforcement.
!"#\$%&'(")(3??', /<(O/I&., "\$ (3%&'4+, +A(BG

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!59:6;<=>'28"SG@@ID"Y=6-\'.VA"O/I&.,

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8 - /='\$=&- /D" #AD" e+.=&+D"WAD" <" ! 59:6; <=>' 2 8D"SG@G!D"M+OVA" :#\$-I/\$(&%&'4+,+(")&5&</; ,5(
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[- , -6/OD"MA#AD" ! 59:6;<=>' 2 AD" <") -0(' /D" 5A"SG@! ID" M+OVA" Z+,%K(& ; '-, .&, </\$(- "(,%5\$/&+/(@/I&., "\$(+?/5), 5(?\$&, +/()\$" ; (+&)) , %(&(\$/+, </%- , &'()&5, ', -4A"2+\$'."\$. ' 1' /6' (" +6"6*" +// ; +%#) #Z"=- /7' . ' /='D" : +/" 5&'3-D" 8 #A"

8+16.-D" : AD" ! 59:6;<=>' 2 8D" <"M--.'D"da"SG@! ID" M+OVA" T/&5I,%K(5#', %&\$4(+9, ''+(#+,%K(., </" ; "</,%K(- "(,%<, ., <#&'+(S, -I(-\$&# ; &- ,5(@\$&, % ,% # \$4A"2+\$'."\$. ' 1' /6' (" +6"6*" +// ; +%#) #Z"=- /7' . ' /='D" : +/" 5&'3-D" 8 #A"

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:04\$-1& ; 4"\$.' 1' /6' (" +6"6*" " 4 ' '6&/3" -7"6*" "9%- .&(+ # 11- =&+6&- /"7-. .") '*+, &- ." # /+%01&1"
8 - /7' . ' /='D" 5+06- /+)) '+=*D"9EA"

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&5\$""++(+, ; #'#+(; "< /+(, %/5I, '<\$/%<, &K%" + /<(S, -I(&#-, + ; (+?/5-\$# ; (<, + "\$</\$J(2+\$' ."
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Z- , + / / - / 'D"WAD'R- (3' 1D' : AD" < " ! 59:6; <=>' 28'SG@ ! UD"9' \ . ; + .OVA"2 ; ?\$". , %K(/ < #5&- , "%&'(+ #55/++()) "\$(
4"#-I(, %()) "+- / \$(5&\$ / (S I"(\$#%(&S&4J(2+\$' . "\$. '1' / 6+6&- / "+6"6* "' 4 ' '6&/3"-7"6* "' [+6&- / +"
11 - = & + 6&- / " - 7" : = * - - % " 210 = * - % - 3&161"S [# : 2VD" b + 1* & / 36- / D" 5 8A"
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: & / 3' .D"EA : AD" ! 59:6; <=>' 28' * 8D" < "9-3' %D" aA#A"SG@ ! ?D" : '\$6' 4 \ ' .VA"L)) / 5-+(") (\$ / + ? "% + / (5&\$ < + (" % (
-I / (< , + \$ # ? - , . / (@ / I & . , "\$ (") (+ - # < / % - + J (2 + \$' . "\$. '1' / 6' (" + 6"6* "' 4 ' '6&/3"-7"6* "' 9% - . & (+ "
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K#, </<(%"-/+(%<(\$/+? "%+/ (5&\$<+,(%+#+</%-(?/\$) "\$; &%5/J(2+\$' ". \$.' 1' /6' (" +6"6*" " 4 ' ' 6&/3"
-7"6*" " # 11 -=&+6&- /"7-.") ' *+, &-." # /+%01&1"Z/6' . /+6&- /+%D"M&/ / '+\$- %&1D"M [A"
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! 59:6; <=>' 28"SG@! ?D"M+OVA" *\$") /++ , "%&' (<./.' /' ? ; /%-(+/\$, /+D(>./.' /' ? , %K(5', %5&' (+9, ' +)) \$(
S "\$9, %K(S, -I) & ; , , /+J(2+ / ' %" (&1=; 11&- /" +6"6*" " 4 ' ' 6&/3"-7"6*" " # 11 -=&+6&- /"7-.") ' *+, &-." # /+%01&1"Z/6' . /+6&- /+%D"M&/ / '+\$- %&1D"M [A"
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\$" #, %+/ (S, -I(4" #K(5I, ' <\$ /%J(2+\$' ". \$.' 1' /6' (" +6"6*" " 4 ' ' 6&/3"-7"6*" " # 11 -=&+6&- /"7-.") ' *+, &-." # /+%01&1"Z/6' . /+6&- /+%D"M&/ / '+\$- %&1D"M [A"
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! 59:6; <=>' 28D"9' .. ' &. +D" QAD" <" Z- , + / - / - ' D" WA"SG@! ?D"M+. =*VA" : # %5-, "%&' (&+ / + + ; /%-(&%<
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&%< , %- / \$. /%-, "%(; " < / ' (- " (< / 5 \$ / & + / (\$ # % & S & 4 @ / I & . , " \$ (") (4 " # - I , % () " + - / \$ (5 & \$ / J (2 + \$ ' ". \$. ' 1' / 6' (" + 6" 6 * " 4 ' ' 6 & / 3 " - 7" 6 * " # 11 - = & + 6 & - / " 7 - . ") ' * + , & - . # / + % 0 1 & 1 D " d + = _ 1 - / , & % % ' D " 9 E A "
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8 - /7' . ' / = ' D" C + 4 \$ + D" 9EA"
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Z- , + / - / - ' D" WAD"9' .. ' &. +D" QAD" <" ! 59:6; <=>' 28"SG@! ?D"9' \ . ; +. OVA"2 ; ?\$" . , %K (<#5&-, "%&' (+#55/++(
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8+ . + , ' % % - D" QAD" <" ! 59:6; <=>' 28"SG@! GD" : '\$6' 4 \ ' . VA" O " " + - / \$ (-\$&, %K (# + , %K (. , < / " (; " < / ' , %K () "\$ (5 & \$ / K , . / \$ + , % () " + - / \$ (5 & \$ / J (2 + \$ ' ". \$. ' 1' / 6' (" + 6" 6 * " 4 ' ' 6 & / 3 " - 7" 6 * " 9 % - . & (+ " # 11 - = & + 6 & - / " 7 - . ") ' * + , & - . # / + % 0 1 & 1 D " d + = _ 1 - / , & % % ' D " 9 E A "
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! 59:6; <=>' 28D"d-1 '\$ *D" WAD"9' .. ' &. +D" QD" 8%+ . _D" RA) AD" <" 5 ; /%+\$D" eA"SG@! GD" : '\$6' 4 \ ' . VA" 6 /) , %K (& (
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"

Q- ' * % ' .D" : AD" ! 59:6; <=>' 28D" <" 2' . (- 4 +D" #A"SG@! GD" : '\$6' 4 \ ' . VA" 7 " 5 , &' (+9, ' +(-\$&, %K () "\$ (4 " # - I , % () " + - / \$ (5 & \$ / J (2 + \$ ' ". \$. ' 1' / 6' (" + 6" 6 * " 4 ' ' 6 & / 3 " - 7" 6 * " 9 % - . & (+ " # 11 - = & + 6 & - / " 7 - . ") ' * + , & - . # / + % 0 1 & 1 D " d + = _ 1 - / , & % % ' D " 9 E A "
) " + - / \$ (5 & \$ / J (2 + \$ ' ". \$. ' 1' / 6' (" + 6" 6 * " 4 ' ' 6 & / 3 " - 7" 6 * " 9 % - . & (+ " # 11 - = & + 6 & - / " 7 - . ") ' * + , & - . # / + % 0 1 & 1 D " d + = _ 1 - / , & % % ' D " 9 E A "
/ + % 0 1 & 1 D " d + = _ 1 - / , & % % ' D " 9 E A "
"

b += _D" : AD" ! 59:6; <=>' 28D" <" M&%6' / \ ' . 3' .D" WA"SG@! GD" : '\$6' 4 \ ' . VA" Z + , %K (& (K " &' X + / - , %K (& % < (
) // < @ & 59 (? \$ " 5 / < # \$ / - " (, % 5 \$ / & + / (\$ # % % , % K (< , + & % 5 / J (2 + \$ ' ". \$. ' 1' / 6' (" + 6" 6 * " 4 ' ' 6 & / 3 " - 7" 6 * " 9 % - . & (+ " # 11 - = & + 6 & - / " 7 - . ") ' * + , & - . # / + % 0 1 & 1 D " d + = _ 1 - / , & % % ' D " 9 E A "
9 % - . & (+ " # 11 - = & + 6 & - / " 7 - . ") ' * + , & - . # / + % 0 1 & 1 D " d + = _ 1 - / , & % % ' D " 9 E A "
"

:+BO' .D" MAD" ! 59:6; <=>' 28D" <" W- / ' D" #A"SG@! GD" : '\$6' 4 \ ' . VA" M&\$ / K , . / \$ (-\$&, %K (<#\$, %K (?\$" @' / ; &- , 5(\$" #, %+/ (S, -I(4" #K(5I, ' <\$ /%J(2+\$' ". \$.' 1' /6' (" +6"6*" " 4 ' ' 6&/3"-7"6*" " 9%-. &(+ " # 11 -=&+6&- /"7-.") ' *+, &-." # /+%01&1D" d+=_1- / , &%% ' D" 9EA"
? \$ " @ ' / ; & - , 5 (\$ " # , % + / (S , - I (4 " # K (5 I , ' < \$ / % J (2 + \$ ' ". \$. ' 1' / 6' (" + 6" 6 * " 4 ' ' 6 & / 3 " - 7" 6 * " 9 % - . & (+ " # 11 - = & + 6 & - / " 7 - . ") ' * + , & - . # / + % 0 1 & 1 D " d + = _ 1 - / , & % % ' D " 9 E A "
11 - = & + 6 & - / " 7 - . ") ' * + , & - . # / + % 0 1 & 1 D " d + = _ 1 - / , & % % ' D " 9 E A "
"

: '+.1D"QAD") %&.D"QAD"Z-, +/ / - / 'D"WAD" < " ! 59:6; <=>' 28"SG@ !GD": '\$6' 4 \ ' .VA"Z+, %K(-I/(?\$/ . /%-X- /&5IX
\$/ , %) "\$5/ (; "</'(S, -I)& ; , ' , /+(S, -I(5I, '<\$/%/(S, -I(&#-, +; J(2+\$' . "\$. '1' /6' (" +6"6*" 4 ' '6&/3"
-7"6*" "9%-. & (+ # 11 - = & + 6& - / "7-.) ' * + , & - . # / + % 01&1D"d += _1 - / , & % % 'D"9EA"
"

! 59:6; <=>' 28D"9' .. '&. +D"QAD" < "d-1 '\$*D"WASG@ !GD": '\$6' 4 \ ' .VA" h 8 I / \$ / (&\$ / (4 "#db (> /5\$ / & + , %K(
\$#%&S&4 (@ / I& . , "\$ + (&% < (, ; ?\$ " . , %K(/ < #5&- , "%&' (+ #55 / + + () "\$ (4 "#-I (, %) " + - / \$ (5&\$ / J(2+\$' . "
\$. '1' /6' (" +6"6*" 4 ' '6&/3" -7"6*" "9%-. & (+ # 5 '\$ + .64 ' /6' -7"8* & % (. ' / + / ("9 + 4 & % & ' 1"8* & % ("
2. -6' = 6& - / " : ; 4 4 & 6K"W' + % & c& / 3"8* + / 3 'D"Y . % + / (-D"9EA"
"

! 59:6; <=>' 28D"9' .. '&. +D"QAD" < "d-1 '\$*D"WASG@ !GD"d; %OVA(3% (, % - / \$. / % - , "% (; "</' (- " / < /5\$ / & + / (
\$#%&S&4 (@ / I& . , "\$ (") (4 "#-I (, %) " + - / \$ (5&\$ / (&% < (, ; ?\$ " . / (/ < #5&- , "%&' ("#-5" ; / + J(2+\$' . "
\$. '1' /6' (" +6"6*" 4 ' '6&/3" -7"6*" "9-16' . "9 + 4 & % \ H + 1' ("C. ' +64 ' /6' # 11 - = & + 6& - / D" # 6% + / 6 + D" e # A"
"

8 + . + , ' % % -D"QAD" < " ! 59:6; <=>' 28"SG@ !GD" M + OVA" 3% (/ . & '#&- , "% (") (& @ / I& . , "\$ (- " " " + @ " " + - / \$ (- \$ & , % K(
+ , % K (. , < / " (; "</' , % K (S , -I () " + - / \$ (? & \$ / % - + A" 2 + \$' . "\$. '1' /6' (" +6"6*" 4 ' '6&/3" -7"6*" "
11 - = & + 6& - / "7-.) ' * + , & - . # / + % 01&1"Z/6' . / + 6& - / + % D" : ' +66% 'D" b # A"
"

] .. & 6OD" dAD" < " ! 59:6; <=>' 28"SG@ !GD" M + OVA" Z-, , ^ , % K (? \$ " @ & @ , ' + , - , 5 (\$ / , %) "\$ 5 / ; / % - (- " / % I & % 5 / (
? & \$ - , 5 , ? & - , "% (, % (@ / I& . , "\$ & ' (? & \$ / % - (- \$ & , % , % K) 2 + \$' . "\$. '1' /6' (" +6"6*" 4 ' '6&/3" -7"6*" "
11 - = & + 6& - / "7-.) ' * + , & - . # / + % 01&1"Z/6' . / + 6& - / + % D" : ' +66% 'D" b # A"
"

! 59:6; <=>' 28" * 8D" < " 8 % + . _D" R A) A" SG@ !GD" M + . = * VA" 3% (, % - / \$. / % - , "% (; "</' () "\$ (< /5\$ / & + , % K (6 # % & S & 4 (
@ / I& . , "\$ (&% < (+ - & @ , ' ^ , % K (? ' & 5 / ; / % - + () "\$ (4 "#-I (, %) " + - / \$ (5&\$ / J(2+\$' . "\$. '1' /6' (" +6"6*" "
4 ' '6&/3" -7"6*" "8* & % (. ' / ^ 1" M' / 6 + % " R' + % 6* " W' 1' + . = * + / ("2 - % & = 0" 8 - / 7' . ' / = "D" C + 4 \$ + D" 9EA"
"

R ; 4 4 ' .D" a A" < " ! 59:6; <=>' 28"SG@ ! !D" Y = 6 - \ ' .VA" T\$ & # ; & X2%) "\$; / < (O / I& . , "\$ (7#??"\$ - (i(3(- \$ & , % K(
& % < (5" & 5I, % K (; "</' () "\$ (5&\$ / K, . / \$ + J(b - . _1* - \$ \$. '1' /6' (" +6"6*" 4 ' '6&/3" -7"9Y8 > : "G@ ! !K"
e ' 66&/3" 6 - "6* " R' + . 6 - 7"6* " M + 66' .D" p - ; 6* + / ("9 + 4 & % O" : ' . , & = 1" [' 6B - . _D" Y . % + / (-D" 9EA"
"

R ; 4 4 ' .D" a AD" ! 59:6; <=>' 28D" < " 5 - % % + . (D" [A" SG@ ! !D" Y = 6 - \ ' .VA" T\$ & # ; & (2%) "\$; / < (O / I& . , "\$ (7#??"\$ - (
HT207ID(3(- \$ & , % K (& % < (5" & 5I, % K (; "</' () "\$ (5&\$ / K, . / \$ + A" b - . _1* - \$ \$. '1' /6' (" +6"6*" "
4 ' '6&/3" -7"6*" [+ 6& - / + % " 9' (' . + 6& - / " - 7"9 + 4 & % & ' 1"7-. "8* & % (. ' / ^ 1" M' / 6 + % " R' + % 6* " D"
500050(A(%) 0.2.2(1) - 8.5.2((61cmBTT500501987.679-959Tm/TT91Tf [(3)0.2((-)0.2(\$0.248.50(

"

:& 4 4 - /1D" 5AMAD" ! 59:6; <=>' 28' * 8D" <" 2+. 'P-D" aA"SG@ !@D": '\$6' 4 \ '.VA"M"; ?&\$,%K(-I/(/))/5-, ./%/++(
")(/I&., "\$&'5"-&\$&5-+(-I&-(#+/(/)#%5-, "%X@&+<(\$/,%) "\$5/\$+(./\$+#+(I,KI'4(?\$/)/\$\$/<(-./; +J
2+\$'."\$. '1' /6' (" +6"6*" " 4 ' '6&/3" -7"6*" "9"-.&(+ #11-=&+6&- /"7-.) ' *+, &-. "# /+%01&1D"
Y.%+ / (-D"9EA"

""

! 59:6; <=>' 28' * 8D" <" 8%+._D"RA) A"SG@ !@D"M+.=*VA" 6 /<#5,%K(\$#%&S&4+(&%<(+&@, ',^,%K() "+-/\$
?'&5 /; /%-+() "\$(&<'"/+5/%+D(7-#<4()), %<,%K+(&%<(@/+-(?&5-, 5/(; "</'J(2-16'."\$. '1' /6' (" +6"
6*" " 4 ' '6&/3" -7"6*" "W'1'+.=*" + / ("C.+&/&/3" 8' /6' ."8- /7' . /=" - /"8*%&(. / ^1"M' /6+%
R' +%6*D"C+4 \$+D"9EA"

"

:& 4 4 - /1D" 5AMAD" ! 59:6; <=>' 28' * 8D" <" 2+. 'P-D" aA"SG@ !@D"M+OVA"M"; ?&\$,%K(-I/(/))/5-, ./%/++(
")(/I&., "\$&'5"-&\$&5-+(-I&-(#+/(/)#%5-, "%X@&+<(\$/,%) "\$5/\$+(./\$+#+(I,KI'4(?\$/)/\$\$/<(-./; +J
2+\$'."\$. '1' /6' (" +6"6*" " 4 ' '6&/3" -7"6*" " #11-=&+6&- /"7-.) ' *+, &-. "# /+%01&1Z/6' ./+6&- /+%D"
: + / "# /6- /&-D"C i A"

"

! 59:6; <=>' 28' * 8D" 8%+._D": AD" 5; /%+\$D" eAD" <" ['77D") A"SG@ !@D"M+OVA" 3%(&%&'4+, +(")(\$/?"\$- /<(<,+&- /'
<&-&(5""'/5-, "%(/-1" <+(&-, '^<(<(%&,-/\$. /%-, "%(\$/+&\$5I(+&#<, /+J(2-16'."\$. '1' /6' (" +6"6*" "
4 ' '6&/3" -7"6*" " #11-=&+6&- /"7-.) ' *+, &-. "# /+%01&1Z/6' ./+6&- /+%D": + / "# /6- /&-D"C i A"

"

5 - %%+. (D" [AD" ! 59:6; <=>' 28' * 8D" 2+; %1- /D"WAD"M+=Q&/ / - /HE' B&1D" 8AD" <" ['77D") A"SG@ !@D"M+OVA"
2; ?' /; /%-&- , "%(&%<(&55/++(")(&??', /<(@/I&., "\$(&%&'4+, +(+/\$., 5/+(%& ; &%&K/<(< /%&-&'
I/&'-I(&%<(5" ; ; #%, -4X@&+<(&5&\$/J(2+\$'."\$. '1' /6' (" +6"6*" " 4 ' '6&/3" -7"6*" " #11-=&+6&- /"7-."
) ' *+, &-. "# /+%01&1Z/6' ./+6&- /+%D": + / "# /6- /&-D"C i A"

"

! 59:6; <=>' 28' * 8D" <" ['77D": A"SG@ND"M+OVA" T/&5I,%K(-/ /%+(- ""'+()) "\$(-/\$\$,), 5(-\$&%+, -, "%+J(b - . _1*-\$
\$. '1' /6' (" +6"6*" " 4 ' '6&/3" -7"6*" " #11-=&+6&- /"7-.) ' *+, &-. "# /+%01&1Z/6' ./+6&- /+%D" 2* - / &jD"
1A"

"

['77D") AWAD" 8%+._D"RA) AD" a - %% 4 ' ."CAWAD" ! 59:6; <=>' 28' * 8D" <" b %%%&+ 4 1D" 8A] A"SG@ !@D"M+OVA" TI /
@/I&., "\$(&%&'4+, +(+/\$., 5/+(? "\$K&& ; D(8 I / \$ / (S / C. / (@ / / % J (2 + \$' ."\$. '1' /6' (" +6"6*" " 4 ' '6&/3"
-7"6*" " #11-=&+6&- /"7-.) ' *+, &-. "# /+%01&1D" 8 * & = + 3 - D"ZE"

"

C* - 4 \$1- /D"dAD" ! 59:6; <=>' 28' * 8D" ['77D": AD" b ' &11D"QA aAD" <" 1 + 4 - . 'D") AMA"SG@ !@D"M+OVA" 7"5, &'
+9, '+(-\$&,%&K(S, -I(-4?, 5&'4(<./.'/'? ,%K(&<'"/+5/%+D(V/&+#\$/; /%-(")(+9, '(&5`#+, -, "%J(
2+\$'."\$. '1' /6' (" +6"6*" " 4 ' '6&/3" -7"6*" " #11-=&+6&- /"7-.) ' *+, &-. "# /+%01&1D" 8 * & = + 3 - D"ZE"

"

e ' %% ' .D" 5AD"Q' // 'OD"CA#AD" 8 .&\$ 'D" MAD" 8 -% - /D"dAEAD" 8%+._D"RA) AD" <" ! 59:6; <=>' 28' SG@ !@D"M+OVA" Z+ /
")(-I/(N"#-I(2%-\$&5-, "%(T""'(S, -I(I&@, -#&'(\$#%&S&4(4"#-I+D(7#55/++/(&%<(&), '#\$/+J(
2+\$'."\$. '1' /6' (" +6"6*" " 4 ' '6&/3" -7"6*" " #11-=&+6&- /"7-.) ' *+, &-. "# /+%01&1D" 8 * & = + 3 - D"ZE"

"

! 59:6; <=>' 28D"Q' +6&/3D" #AD"C* - 4 \$1- /D"dAD") -O' .D"] A: AD" b ' &11D"QA aAD" 1 + 4 - . +D") AMAD" <" b '\ \D"QA"
SG@ !@D"M+OVA" * &\$ /% - (-\$&,%&K(S, -I(-I/(- ""'+()) "\$(?"+, -, . / (@ / I&., "\$5I&%K/D(TI/(/))/5-+(")
K\$"#?(-\$&,%&K(&%<(&X I " ; / (5 " & 5 I , % K J (2 + \$' ."\$. '1' /6' (" +6"6*" " 4 ' '6&/3" -7"6*" " #11-=&+6&- /"
7-.) ' *+, &-. "# /+%01&1D" 8 * & = + 3 - D"ZE"

"

Q' +6&/3D" #AD" !59:6; <=>' 28D" ['77D")AWAD" <" 5 ; /%+\$D" eA"SG@@ID"M+OVA"L. &'#&-, %K(&'-\$%&- , ./(
. &'#&&@/'/"#-5" ; /(& ; /&+#\$/+D(*&\$/%-&'(+-\$/+&(&%<(</?\$/++ , "%J(2+\$' ."\$. '1' /6' (" +6"6*'"
4 ' '6&/3" -7"6*'" #11 -=&+6&- /"7- .") '*+ , &- ." # /+%01&1"Z/6' . /+6&- /+%D" 8* &=+3 -D"ZE"

['77D") AD" !59:6; <=>' 28D" 8%+ . _D"RAD" 5 ; /%+\$D" eAD"2&=_% 'D"WAD" e '%%' .D" 5AD" 8. &\$'D" MAD" <"Q' // 'OD"CA"
SG@@JD" : '\$6' 4 \ ' .VA" 3()#%5- , "%&'(&???"&5I(-"(\$/<#5, %K(\$#%&S&4+(&%<(+&@, ', ^, %K(
?'&5/ ; /%-+() "\$(&<"'/+5/%-+(, %())"+-/\$5&\$/J(2+\$' ."\$. '1' /6' (" +6"6*'" 4 ' '6&/3" -7"6*'" 9%-. &(+
#11 -=&+6&- /"7- .") '*+ , &- ." # /+%01&1D"d+=_1- / , &%%' D"9EA"

!59:6; <=>' 28D"Q' +6&/3D" #AD"C* - 4\$1- /D"dAD") -0' .D"]AD" 1+4 - .+D") AD" b ' &11D"QAD" b '\ \D"QAD" <"M' % 'D"
:A"SG@@JD" : '\$6' 4 \ ' .VA"L. &'#&-, %K(-I/(%/<()) "\$(@"-I(, %X5'&+(&%<(, %XI" ; /(-\$&, %, %K(
5" ; ?"/%+J(2+\$' ."\$. '1' /6' (" +6"6*'" 4 ' '6&/3" -7"6*'" 9%-. &(+ " #11 -=&+6&- /"7- .") '*+ , &- ."
/+%01&1D"d+=_1- / , &%%' D"9EA"

!59:6; <=>' 28" *8D" ['77D") AD" <" 8%+ . _D"RA" A"SG@@JD"d; %OVA" : "'\$, &c+(@/I&., "\$(&%&'4+, +(/\$. , 5/(
?\$"K&\$; D(=#-5" ; /(<&-&())\$" ; (@"-I(5&\$/K, . /\$+(&%<(5I, '<\$/%J(2+\$' ."\$. '1' /6' (" +6"6*'"
4 ' '6&/3" -7"6*'" 9-16' . "9+4 &Ou\+1' ("C. ' +64 ' /6" #11 -=&+6&- /D"Y. %+/ (-D"9EA"

!59:6; <=>' 28" *8D" b &%= - jD" 8AD" : +3+.D" b AD") %+/=-D" #AD" e &((&/31D"CAD" <" 5 ; /%+\$D" eA"SG@@JD"M+OVA"
Z+, %K(-I/(-""'+) "\$(?"+, - , ./(@/I&., "\$5I&%K/(-"(", ; ?\$". /(+&)) , %-/\$&5- , "%+(, %(K\$"#?(I" ; /+(
)"\$()" +-\$5I, '<\$/%J(2+\$' ."\$. '1' /6' (" +6"6*'" 4 ' '6&/3" -7"6*'" #11 -=&+6&- /"7- .") '*+ , &- ."

1+.- / 'D"dAWAD"E&/ (+; '.D': AD"M-.1'D"2A: AD" ! 59:6; <=>' 2 8D" a+% (-, &/ - 1D" MAD" M=Q' . =*+.D" CAEAD" <"
: =*.- ' ('.A': A"SG@@?D"M+OVA": #5, "%&' (&%&'4+, +, (%(-1/(/. &'#&- , "%(")(-1/(/))/5+("/)
\$, +?/\$, <"%/("%(</+-\$#5-, ./@/I&., "\$J(2+\$' ". \$. '1' /6' (" +6"6* " 4 ' '6&/3"-7"6* " #11- =&+6&- /"
7-.)' *+, &- . # /+%01&1D": +/"9. +/=&1=-D" 8 #A"

1+.- / 'D"dAWAD" ! 59:6; <=>' 2 8D"E&/ (+; '.D': AD" <" 1+.- / 'D"CA"SG@@?D"M+OVA"TI/(/))/5+("/)(\$, +?/\$, <"%/(
, %(-1/(-\$/&- ; /%(-")(+-\$/"-4?4(S, -I(<"'/+5/%-(S, -I(&#-, +; J"2+\$' ". \$. '1' /6' (" +6"6* "
4 ' '6&/3"-7"6* " #11- =&+6&- /"7-.)' *+, &- . # /+%01&1D": +/"9. +/=&1=-D" 8 #A"

! 59:6; <=>' 2 8" *8D"W' '1'D"WAMAD" 1+.- / 'D"dAWAD" <": =*.- ' ('.D': AWA"SG@@GD"M+OVA"MI&%K/+(, %(
+-\$/"-4?/<(@/I&., "\$+(, %5I, '<\$/%(S, -I(; /%-&'(\$/-&\$<&- , "%(&%(<(&#-, +; J(2+\$' ". \$. '1' /6' (" +6"
6* " 4 ' '6&/3"-7"6* " #4 ' .&=+/" #11- =&+6&- /"- /"M' /6+%W'6+. (+6&- /D"Y. %+/ (-D"9EA"

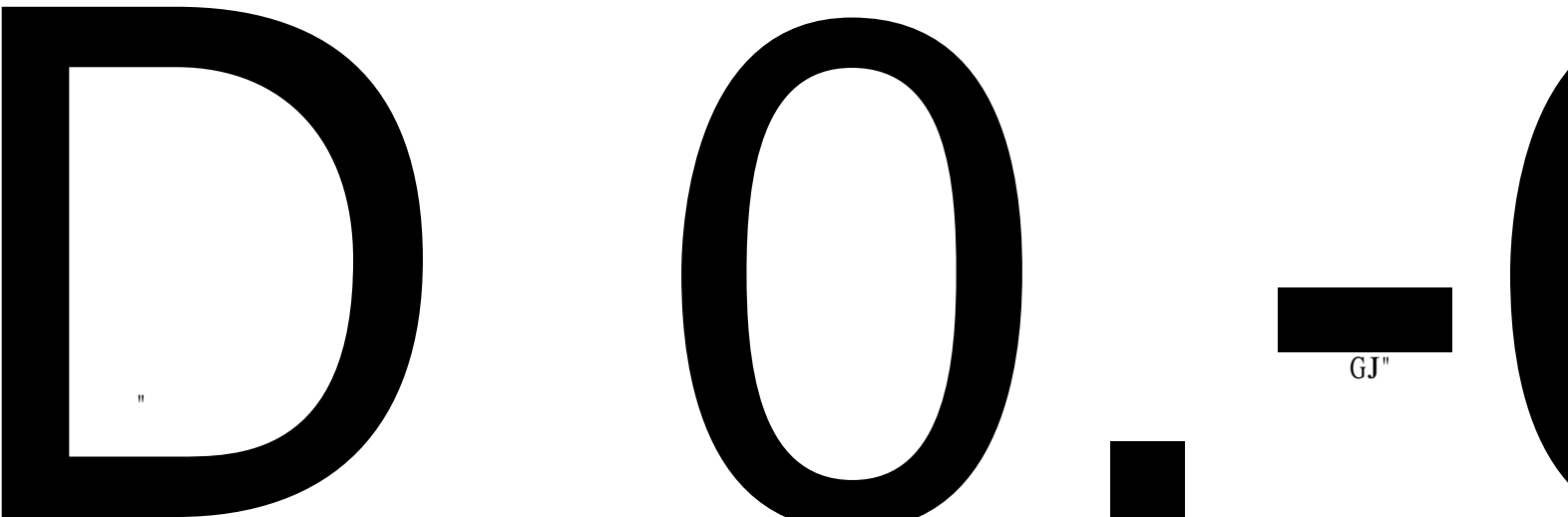
! 59:6; <=>' 2 8" *8D" 1+.- / 'D"dAWAD" 1+.- / 'D"CAD"9-B% '.D': AD" <": =*.- ' ('.D': AWA"SG@@GD"M+OVA"Z+/(("/)
&(&(&-%/5/</%(-&%&'4+, +(&%(<(&(")\$5/(+/+%+, -./(?'&-)"\$; (-"5"; ?&\$/(5I, '<\$/%(S, -I(
+-\$/"-4?, 5/@/I&., "\$+(&%(< ; "-"\$(-, 5+J(2+\$' ". \$. '1' /6' (" +6"6* " 4 ' '6&/3"-7"6* " #11- =&+6&- /"
7-.)' *+, &- . # /+%01&1D"C-. - /6-D"8+/(+A"

W&=* 4 +/D" 5 AD"E&/ (+; '.D': AD" <" ! 59:6; <=>' 2 8"SG@@!D"M+OVA"=#-?&- , /%(-&%(<5"; ; #%, -4(+/"X
, %\$#, "#+(@/I&., "\$(+/\$, 5/(&-1/(Z%, ./\$+, -4("/) (e &%+&+(V /<, 5&'(M/%-\$J(2+\$' ". \$. '1' /6' (" +6"
6* " 4 ' '6&/3"-7"6* " #11- =&+6&- /"7-.)' *+, &- . # /+%01&1D" ['B"Y.%' +/1D"E#A"

! 59:6; <=>' 2 8D" 1+.- / 'D"dAD": =*.- ' ('.D': AD" <"W' '1'D"MA"SG@@!D"M+OVA" *\$/. &' /%5/(("/) (+-\$/"-4?4(
& ; "%K(5I, '<\$/%(<, &K%" +/(<(S, -I(&#-, +; (&-(&(-/\$-, &\$4(\$/)/\$&'(5', %, 5J(2+\$' ". \$. '1' /6' (" +6"6* "
4 ' '6&/3"-7"6* " #11- =&+6&- /"7-.)' *+, &- . # /+%01&1D" ['B"Y.%' +/1D"E#A"

M-.1'D"CAD" ! 59:6; <=>' 2 8D"E&/ (+; '.D': AD" <" 1+.- / 'D"da"SG@@!D"M+OVA"Z+, %K(?\$/\$5#\$+ "\$(&%&'4+/(+(&(
&(&(&'-\$%&- , ./(-")#5, "%&' (&%&'4+/(("/) (+-\$/"-4?4(S, -I(&#-, +; (&-(&(-/\$-, &\$4(\$/)/\$&'(5', %, 5J(2-16' ". \$. '1' /6' (" +6"
6* " #11- =&+6&- /"7-.)' *+, &- . # /+%01&1D" ['B"Y.%' +/1D"E#A"

M=Q' . =*+.D"CAD" ! 59:6; <=>' 2 8D" 1+.- / 'D"dAD" 1+.- / 'D"CAD" <"W&=* 4 +/D" 5 A"SG@@!D"M+OVA" 3(
5"; ?#-/\$, ^/<(/-1" <(")\$(`#&%-,)4, %K(&@/\$\$&(-@/I&., "\$(" @+/\$. /<(/%)#5, "%&' (&%&'4+/(+J(
2-16' ". \$. '1' /6' (" +6"6* " 4 ' '6&/3"-7"6* " #11- =&+6& 4 8. 5039 5 93. 65 61cmBT5 0000. 2 4 8. 5 0390. 2 (.D':) -0.



! 59:6;<=>'2 8D"1+.- / 'D"dAD"1+.- / 'D"CAD"9-B%''.D":AD"<"E&/ (+; '.D":A"SG@@@D"M+OVA"3(5"; ?#-/\$,^/<(; /-I"<())"\$(`#&%-,)4,%K(\$/?/-,-. /(@/I&., "\$J(2-16'."\$. '1' /6' ("6* "4 '6&/3"-7*6* "' #11 -=&+6&- /"7-.") '*+, &- .# /+%01&1D" b +1*&/36- /D"5A8A

"

! 59:6;<=>'2 8D"1+.- / 'D"dAD"1+.- / 'D"CAD"E&/ (+; ' .D":AD"<" a+%(- ,&/ -1D"MA"S!NNND"M+OVA":#%5-, "%&'(&%&'4+,+(")</+-\$#5-,./(@/I&., "\$(<#\$,%K(; #-,?'/(; /<,5&-, "%(; &%,?#'&-, "%+J(2+\$'." \$. '1' /6' (" +6"6*" "4 ' '6&/3"-7"6*" "#11-=&+6&- /"7-.") '*+,&-." # /+%01&1D"8*=&+3-D"ZEA""

"

R' .4 +/D"QAD") - / 'OD")AD" **! 59:6;**<=>'2 8D"9&1*' .D" b AD"<" 5 'E' - /D"ZA"S!NNND"M+OVA"3++/++ ; /%-(&%<(-\$/&- ; /%-(")(&(?\$/)/\$/%5/())\$(</+-\$#5-,./(@/I&., "\$(" ./\$())#%5-, "%&'4(/`#,.&'/%-(&??\$"?\$,&-/(@/I&., "\$J(2-16'."\$. '1' /6' (" +6"6*" "4 ' '6&/3"-7"6*" "#11-=&+6&- /"7-.") '*+,&-." # /+%01&1D"8*=&+3-D"ZEA""

""""

"

9&1*'.D" b AD"C* - 4 \$1 - /D"WAD"2&+cc+D" 8AD" <" ! 59:6; <=>' 2 8'S!NNFD"M+OVA"=%(-I/(\$/'&-, ./(\$/,%) "\$5,%K(/))/5-+(")5I",5/

(
T,-'/K"2.-P'=6"&:] 5K"# (,+/=&/3"Z/6'.(&1=&\$%&/+.0":'. ,&='1"7-." :6;('/61"B&6*":','. '"] 4 -6&- /+%"
+ / (")' *+, &- .+% 5&1-.('.1A"
6'''/("%(R\$&%-K"8-H2.&/=&\$+%Z/ , '16&3+6-."
: #%<,%K(3K/%54K">A:A'5 '\$+.64 '/6"-7"] (;=+6&- /D"Y77&=" "-7":\$ '=&+%"] (;=+6&- /"2.-3.+41"H":\$ '=&+%"
] (;=+6&- /"2'.1-// '%2.'\$+.6&- /"e.+ /6"
3; "#%-(")(: #%<,%KK"v!D!NFDU!N"
*\$"_/5-(>&- /+K": '\$"G@G@u#;3"G@GO"
"
T,-'/K"5', '%-\$4' /6"

K"

?!"

"

T,-'/K'5', '%-\$4'/'6"-7"+/'Z/6'.', '/6&-/'M- ('%'6-"Z4\$.-, '"] (;=+6&- /+%Y;6=- 4 '1"-7" p - ;6*"&/'
9-16'."8+.'"\0"5'='.'+1&/3"W; /+B+0") '*+,&.-."

6'''/'("%(R\$&%-D(2.&/=k\$+%Z/ , '16&3+6-."
: #<,%K(3K/%54K">A: A'5 '\$+.64' /'6"-7"] (;=+6&- /"Z/16&6;6'" -7"] (;=+6&- /": =k' /='1"
3; "#%-('): #<,%KK"v!D??IDNOF"
*\$"_/5-(>&- /+K"d; %O"G@!!ud; %O"G@!F"
(

T,-'/D(); &%(&/3": =* - -%H8*%&%(" b '%7+. '"8 -%%+\ - .+6&- /"7- ."8*%&%(. /" + / (" p - ;6*"&/'9-16'."8+.'"
6'''/'("%(R\$&%-D(8-H2.&/=k\$+%Z/ , '16&3+6-."
: #<,%K(3K/%54K"> /& , '.1&60"-7": - ;6*"9%- .&(+ "Y77&=" -7"8-44 ; /&60"] /3+3'4' /'6" <"2+.6/ '.1*&\$1"
3; "#%-('): #<,%KK"vFDING"
*\$"_/5-(>&- /+K"M+O"G@! ?u# ;3; 16"G@! ?"
"

T,-'/K'] , +% ; +6&- /"-7" M' (&=+&(H9; / (' ("Y;6"-7"R-4' "#%6' . /+6& , '1"
6'''/'("%(R\$&%-K") '*+, &.-. +% "8 - /1; %6+ /6"
: #<,%K(3K/%54K" #3' /='0"7- ."R' +%6*"8+.' "# (4& /&16.+6&- /"
3; "#%-('): #<,%KK"v!NFD! IN"
*\$"_/5-(>&- /+K"d; / "G@! @ud; / "G@! G"
"

T,-'/K": '= - / (+.0"5+6+"# /+%01'1"-7" p - ;6*"&/'9-16'."8+.'K"8*.- /&="W; / / '.1", '.1; 1" p - ;6*"&/'
: 6+\ % "2%+= '4' /61"
6'''/'("%(R\$&%-D(2.&/=k\$+%Z/ , '16&3+6-."
: #<,%K(3K/%54K"5 '\$+.64' /'6"-7") '*+, &.-. +% + / ("8-44 ; /&60": =k' /='1"Z/6' . /+% e . + /6"2.-3.+4"
3; "#%-('): #<,%KK"vJDO@@"
\$"_/5-(>&- /+K"M+. ="G@NuM+. =*"G@! @"
"

T,-'/K'8 - /6. - %% ' ("8&/&=+%C.&+%1"-7" #60\$&=+% [' ; .-% '\$&=1"u"9; /='6&- /+%# /+%01&1": ; \$\$%'4' /'6"
6'''/'("%(R\$&%-K"W'1'+.=*"#11&16+ /6"
: #<,%K(3K/%54K" [+6&- /+%Z/16&6;6'1"-7"R' +%6*"H" [+6&- /+%Z/16&6;6'" -7"8*%&%("R' +%6*" + / ("R; 4+ /"
5', '%-\$4' /'6"S [ZRH [Z8R5V"
3; "#%-('): #<,%KK"vUGND@@"
*\$"_/5-(>&- /+K"d; %O"!NNI"u5'='4 \ '. "G@! @!"
,

Q#*C)D'D"J&\$) +A'U? -<=3<I'

T,-'/D(: 6' \$\$' ("8+.' "#\$\$.- +=*"7-."# ((. '11&/3" p - ;6*HM-6& , +6' (" : =* - -%W'7; 1+%") '*+, &.-.1"
S: C# pV(
6'''/'("%(R\$&%-K"8-H2.&/=k\$+%Z/ , '16&3+6-."
= -I/\$+ ("(R\$&%-K"W-1' "Z-, + / - / ' "S2ZVD" #&1- /": +%%- ; 4"S8-H2ZVD": *+ / - /": ; %(-"S8-H2ZV"
: #<,%K(3K/%54K">A: A'5 '\$+.64' /'6"-7"] (;=+6&- /"Z/16&6;6'" -7"] (;=+6&- /": =k' /='1"
3; "#%-(')(6/`# /+ /< (: #<,%KK"vGD@D@D@D@A"
>&- / (7#@ ; , - /< D(: '\$6'4 \ '. "G@G?"
,

Q#*C)D'D"J&\$) +A'U"C, "CA+AI'

T,-'/D(:6'\$S\$'("8+.'"#\$\$.-+=*7-."#((.'11&/3"p-;6*HM-6&, +6'(":=*--%"W'7;1+%)' *+,&-.1"

S:C#pV(

6'''/("%(R\$&%-K"8-H2.&/=k\$+%Z/, '16&3+6-."

=-I/\$+("%(R\$&%-K"W-1'Z-, +/ / - / "S2ZVD" #&&1- /": +%%- ; 4"S8-H2ZVD": *+ / / - /": ;%(-"S8-H2ZV"

: #%<, %K(3K/%54K">A:A"5 '\$+.64 ' /6"-7"] (; =+6&- / "Z/16&6; 6'" -7"] (; =+6&- /": =& ' /='1"

3 ; "%#-(")(6/`#/+ - /<(: #%<, %KK"vGD@@@D@@@A"

>&-/(7#@ ; , -- /<D(: '\$6' 4 \ '. "G@GG"

,

T,-'/K"2.-P'=6"E#) #1K"2.'\$+. +6&- /"-7"E'+('.1"&/ "#\$\$&' (") ' *+, &-. "# /+%O1&1"6-"# (, +/= '": =*--%H

) +1' ("Z/6'. , '/6&- /1""

6'''/("%(R\$&%-K"8-H2.&/=k\$+%Z/, '16&3+6-."

=-I/\$+("%(R\$&%-K"QB+/3H: ; /") %+&. "S2ZV"<"8+6&+"8&, & (&/&HM-66+"S8-H

=-I/\$+(("%(R\$&%-K"QB+/3H: ;/")%+&."S2ZV"<"8+6&+"8&,&(&/&HM-66+"S8-H2ZV"
: #<,%K(3K/%54K">A:A"5 '\$+.64 '/6"-7"] (;=+6&- /"u": '\$' =&+"] (;=+6&- /"2' .1- / / "%2. '\$+.6&- /"
e.+/6"
3 ; "#%-(") (6/`#/+/-/<(: #<,%KK"vGD?G!DGO!A"
>&-/(7#@ ; ,--/<D(d; / "'G@!N"
(
T,-'/K"5' , '%-\$4' /6"+/ ("2&%-6"C'16&/3"-7"M-(;%+.H\+1' ("8- /1 ;%6+6&- /";1&/3"] ,&(' /='H)+1' (" "
""""""""2.+6&='1"7-."C'+=*'.1"-7":6; ('/61"B&6*"] 4-6&- /+"5&16; .\+/' "SMYCZa #C] 5V"
6'''/("%(R\$&%-K"2.&=&\$+%Z/ , '16&3+6-."
=-I/\$+(("%(R\$&%-K"W-1'Z- , +/ / - / "'S8-H2ZV"<"5&+ / +": -=&'S8-H2ZV"
: #<,%K(3K/%54K">A:A"5 '\$+.64 '/6"-7"] (;=+6&- /"Z/16&6;6'" -7"] (;=+6&- /": =&' /='1"
3 ; "#%-(") (6/`#/+/-/<(: #<,%KK"v!D?NIDFIIA"
>&-/(7#@ ; ,--/<D(# ; 3;16"G@!I"
(
T,-'/D(5' , '%-\$4' /6"-7"+/

(
T,-'K"5', '%-\$4'/6"-7"2.', '/6HC'+=*HW'&/7-.="]+.%O"Z/6'. , '/6&-/"S2CWH]ZV"M-('%7-."Z/7+/61""
""""""""""+/"C-((%' .1"B&6*": -=&+%H] 4 -6&- /+%+/") '*+, &- .+% "8*+% %' /3' 1A"
6 ""/("R\$&%-K" 8 -

T,- '/D(C.+; 4+HZ/7-.4 ' (") '*+, &- .": ;\$\$-.6"SCZ) :V""
6 ""/(""(R\$&%-K"] , +%; +6&- /" 5&. '=6- ."
=-I/\$+(""(R\$&%-K" [-.&/" 5 -%%+. ("S2ZV"
: #%<, %K(3K/%54K"C* '": ;\16+ /=" #\ ; 1 ' "+ / ("M' /6+%R' +%6*": ' ., &= ' 1" # (4 & /&16.+6&- /"S: #MR: #V""
u"

#\$\$%&'(") '*+,&-. "#/+%01&1"C*' -.'6&=%"Z/6'3.+6&-/" +/ ("8%&/&=%" #\$\$%&=%+6&- /1

G@!FHG@!JK"9+&6*"W'0/-%(1"
G@!FHG@!JK"C+0%-." [+.-c+/&=_"
G@!OHG@!JK"8-;.6/'0"]_"
G@!OHG@!JK"Q&'160"M=[+4'.+ "
G@!OHG@!JK"8+%0/"9.' '("
G@!OHG@!FK"9.+/_ "Q.;_+;1_+1"
G@!OHG@!FK"#\$.&%"50+%"
G@!OHG@!FK") .&'//+"M';. '6"
G@!OHG@!FK"E&cc0"8+11'%%"
G@!OHG@!FK"8*.&16&/+"#/('.1-/"
G@!OHG@!FK"d+=_&"8-*'/"
G@!UHG@!FK"C+_ '4+"d+4 '1"
G@!OHG@!FK"Q+6'"8+4 '.-/"
G@!UHG@!FK"p;. +4"Q&4"
G@!UHG@!FK":+4+/6*+) .-('.&=_"
G@!UHG@!FK"M&=*+'%":c+\- "
G@!GHG@!FK"]%&c+\ '6*"e+./ '66"
G@!UHG@!OK":+.*"R'16'." "
G@!UHG@!OK"d+/' "b *&6"
G@!UHG@!OK"#.+= '%0"#\.' ;"
G@!UHG@!OK"d&%%&+/"5 '9.' &6+1"
G@!UHG@!OK"d'11&=+" :0_ '1"
G@!UHG@!OK"R+% '0"Q.' /6c"
G@!UHG@!OK" [' '%+4"Q*+/"
G@!UHG@!OK"E&1+"Q+(&1-/"
G@!UHG@!OK":+.+")+./ '1"
G@! ?HG@!UK"R'+6*'. "Q'%% '0"
G@! ?HG@!UK":*+// -/"Q&/3"
G@! ?HG@!UK"5 &+/" :+/3; &/- "
G@! ?HG@!UK"d'77.' 0"Y%&,' ."
G@! ?HG@!UK"]%&c+\ '6*":-%% '0"
G@! ?HG@!UK"d'11&=+" #/(. 'B1"
G@! ?HG@!UK"d- /+6*+/" a&/=' /6"
G@! ?HG@!UK"5 &'3-" a+% \ ;' /+"
G@! ?HG@!UK"8+.-%0/"M+ /;1=- "
G@!GHG@! ?K"8*.&16-\$*'.'. :=%%"
G@!GHG@! ?K"R-%0"5 -B/1"
G@!G

G@!!HG@!GK"Q'%1'0"M-.3+/"
G@!!HG@!GK"d-*/"Y^['&%"
G@!!HG@!GK"8-.'0"8-*.1"
G@!!HG@!GK"#40'")-="_"
G@!!HG@!GK":+4+/6*+"9;'10"
G@!!HG@!GK":6',&'HM+.&':" :B&76"
G@!!HG@!!K"d'//0"W-(.&h;'c"
G@@NHG@!GK"].&/'1+/'='_&"
G@@NHG@!!K"5+/'&'%" e-(&1*"
G@@NHG@!!K"d+="-\ "5++."
G@@NHG@!!K"E+;.+ "R+/.+660"
G@@NHG@!!K"#/3'%")' /&6'c"
G@@NHG@!!K"8%+; (&+"C.- /=- /&1"
G@@NHG@!!K"9.+/"]=* ',&+"
G@@NHG@!!K"#1*%'0') .'(/"
G@@NHG@!!K"Q+6*%' /"Q'//0"
G@@NHG@!!K"d'//&7' ." [-+*"
G@@NHG@!GK"Q+.&"] _"
G@@NHG@!@K"W+=* '%' e.+ , '1"
G@@NHG@!@K"#.&="+) -%' =*+%+"
G@@NHG@!@K"E&/ (1+0"R&0+.("
G@@NHG@!@K"Q+=&"2.+6* ' ."
G@@NHG@!@K"E+;.+ "Q;%&_ -B1_&"

"
"

>/(' .3.+(;+6'"R-/-."C*'1&1"8-4 4&66' 'D"8*+&."
G@GGHG@GUK"Q'%%&"8.&1\$-"
G@!IHG@G@K"d;16&/ '") .'/+/"
G@!GHG@!?"K"

"

G@!IHG@G@K").0-/"M&%'."
G@!IHG@!NK"M'..&66":=*'/_"
G@!JHG@G@K"R'+6*'.1'.3'."
G@!JHG@!NK"M+.&11+"[-,-6/0"
G@!FHG@!NK"5&'3-"a+%;'/+"
G@!OHG@!NK"E&/(1'0":%+66'.0"
G@@JHG@NK"#4+/(+"Q'+6&/3"

"
"

?#B,+DD\$BC*%'DB!\$(+)\$+D'

[+6&-/'+"#=#('40"-7"Z/,'/6-.1"S[#ZV"u">:9"8*+\$6'. "G@G?H\$. '1'/6"
#4'.&=+/"210=*-%-3&=+"#11-=&+6&-/"G@GGH\$. '1'/6"
#11-=&+6&-/"7-.")'*+,&-."#/+%O1&1"Z/6'./+6&-/'+" !NNOH\$. '1'/6"

"

" R&&1\-. -;3*"8 - ;/60"E-="W' ,&'B"8 - 4 4 &66' "'M' 4 \ ' ."
*HF3: 4 'D-5E3K-:'C-FV950';F'"D,"

G@@NHG@!G"
G@!GH\$. '1' /6"

'<3E-5:3F7'D-5E3K-'
''<3E-5:3F7'9G'D9HF@' ,6953=;'
' , ;KH6F7'D-<;F-'
' ,

" 8 - /1 ; %6 & /3 "B & 6 * " & 4 \$ % ' 4 ' /6 +6 & - /" -7 " & /6 ' . , ' /6 & - /1 "7 - . ""
" 0 - ; 6 * "B * - " . ; /" +B +0 "7 . - 4 "\$ % += ' 4 ' /61 "
QH6G' !9 ; :F'M-V3 :@' !94 4H<3F7'D-5E3K- :
"

G@!NH\$. '1' /6"