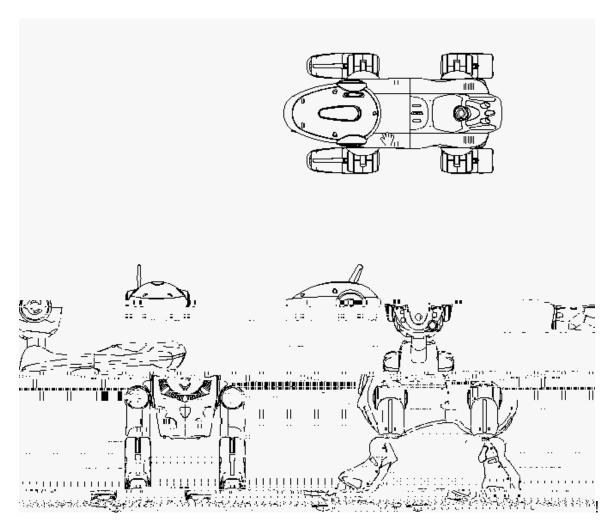
! " #\$%& '(!) ((#\*+! ! , \$%\*\*(!\*-!./+0!&12!, \$#'1\$'0! 3\*0+\*1!4\*(('5'6!4%'0+17+!8#((6!".!

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1'A!:/*5/&99#15!+&/5'+!P#\'C!, *1?L0!.;3<0Q!&12!2'@'(*:!A%&+!*-+'1!+'1!
5/&27&+'!0+72'1+0!A*7(2!+&$G('!+*5'+%'/!!!
1
       H%'!0?0+' 9 0!# 9 : (' 9 ' 1+ ' 2!#1@*(@'!=*+%!A&(G#156!*=\"\$+!/'\$*51#+#*1!&12!
(*$&(#0&+#*10!H%'0'!2'0#510!-*((*A'2!+%*0'!*-!+%'!:/'@#*70!=#5F('&57'/0!#1!+%'!
> *= *$7:!+*7/1&9'1+0 H?:#$&((?!9?!5*&(!A&0!+*!$&:+7/'!+%'!5/*712!=/'&G#15!
2'0#5106!&12!#9:('9'1+!+%'!0#9:('0+!@'/0#*10!*-!+%*0'!2'0#5100!!)@'1!A#+%!=#5!
'?'06!9?!5*&(!A&0!1'@'/!+*!+/7(?!='!$*9:'+#+#@'!#1!+%'!>*=*$7:6!=7+!#10+'&2!+*!
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&12!%'(:!-/* 9!&22##*1&(!+'&9!9'9='/00!
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H\%'!) > , FMMN!$&1!='!0''1!#1!T#57/'!U\emptyset!! . 0!0%* A!#1!+%'!'B+'/#*/!0%*+0\emptyset!+%'!.;3 <!
/*=*+!#0!2'0#51'2!A#+%!R*#1+0!0#9#(&/!+*!+%&+!*-!&$+7&(!(#@#15!2*500!!) &$%!('5!
$*10#0+0!*-!V!R*#1+0!A%#$%!$&1!='!&$$'00'2!@#&!:/#9#+#@'!$*99&120!#1!+%'!$*2'!
/711#15!=?!+%'!/*=*+C!!H%'!:/#9#+#@'!&22/'00'0!&/'!&@&#(&=('!#1!+%'!" *2'(!
;1-*/9&+#*1!57#2'!:/*@#2'2!=?!, *1?!&+!+%'#/!<J)KF>!W'=0#+'C!!H%'!/*=*+0!$*9'!
A#+%!&!0#15('!#1F-&$'!$&9'/&!A%#$%!#0!&$$'00#=('!#1!&!0#9#(&/!-&0%#*10:!. ((!2'+&#(0!*-!
*+%'/!1''206!07$%!&0!=7++*10!*/!-**+!0'10*/06!&/'!-*712!#1!+%'!"*2'(!;1-*/9&+#*1!
57#2'!&12!$&1!='!&$$'00'2!70#15!+%'!0&9'!:/#9#+#@'!$*99&1200!!!
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'&\$%!2'-#1'2!\*=R'\$+!/710!\$\*1\$7//'1+(?C!!.!/\*7127//'937!THJ!

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#9:('9'1+'2!&12!A%&+!+?:'0!*-!#1+'/F*=R'$+!$*9971#$&+#*1!&/'!1''2'26!#0!

1'$'00&/?!#1!*/2'/!+*!='++'/!9&#1+&#1!&12!$*1-#57/'!+%'!1'$'00&/?!0+7=C$-5!&12!

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H%'!$*9:#(#15!*-!+%'!$*2'!-*/!+%'!/*=*+0!#0!0*9'A%&+!2'+&#('2C!!H%#0!#0!9*0+(?!)='$&70'!+%'!+&/5'+!:/*$'00*/!#01L+!+%'!+?:#$&(!*1'C!!H%'!$*9:#('/!#0!(*$&+'2!&+!)*0)/(*$&\<J)K^>^,D]\=#1\C!!.(0*!&!=#1&/?!9&G'/!970+!='!/71!-/*9!

\70\/(*$&(\<J)K^>^,D]\<J)K^>\=#1\9G=#1C!!;1!5'1'/&(6!+%'0'!"&G'-#('0!&/'!*-!+%''!:(75!&12!:(&?!1&+7/'C!!H%''?!$&1!&(0*!0'!+!7:!&!2#/'$+*/?!0+/7$+7/'!+%&+!9&?!='!
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\*-!='1'-#+C!!.::'12#B!.!\$\*1+&#10!&!@'/?!-#1'!'B&9:('!+%&+!&7+\*9&+'0!97\$%!\*-!+%'!

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D48J!&((\*A0!&!%\*0+!+\*!\*=+&#1!&1!;J!&22/'00!&12!&((!\*+%'/!1''2'2!#1-\*/9&+#\*1!

07\$%!&0!2'-&7(+!5&+'A&?!&12!2'-&7(+!"&0G6!2?1&9#\$&((?!&+!0+&/+7:0!!T\*/!/'&0\*10!

+%&+!;!&9!71&A&/'!\*-6!+%'!.;3<0!970+!%&@'!&!0+&+#\$!;J!&22/'00!&12!%&@'!&((!\*+%'/!

1'+A\*/G!\$\*1-#57/&+#\*1!0'++#150!G1\*A1!&+!=\*\*+0!!!!;!A&0!-\*/+71&+'!+\*!\*=+&#1!1\*+!\*1(?!

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A#((!1\*+!A\*/G!\*1!+%'!A#/'('00!1'+A\*/G0!!!

! H%'!(&0+!+%#15!+\*!2\*!='-\*/'!/711#15!#0!+\*!'2#+!+%'!<3b) 4HC4Tc!-#('!(\*\$&+'2!#1!<J))  $KF>\$   $W\4<KT\12\#/'$+*/?C!!H\%#0!-\#('!$*1+&#10!&((!*-!+\%'!*=R'$+0!+*!/71C!!H\%'')!*=R'$+0!A\#((!='!/71!/'5&/2('00!#-!+\%'?!2*!1*+!/'E7#/'!#1+'/F*=R'$+!H*!$&1!='!$*9971#$&+#*1C!!.!1#$'!+\%#15!+*!2*!\%'/'!#0!#1$(72'!&1!THJ!0'/@'/!0*!+\%&+!#+!$&1!='!7+\#(\Pi')'2!+*!/71!/'=**+!$*99&120!/'9*+'(?!&12!*+\%'/!07$\%!+\\#150C!!H\%'!*=R'$+0!970+!='!:(&$'2!#1+*!\<J) <math>KF>\$   $W\3b$ , V!!V1/2'+&#(0!&/'!&@&#(&=('!#1!+\%'!<-:'1F>!,D]!J/\*5/&99'/L0!c7#2'!:/\*@#2'2!=?!,\*1?C!!!

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&!@&/#'+?!\*-!2/#-#156!#1+'/F2':'12&1+!4\*9:7+'/!,\$#'1\$'!H\*:#\$00 H%'0'!+\*:#\$0!
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\$\*9:7#156!&12!\$\*9:7+'/!@#0#\*10!!.+!-#/0+!+%'/'!A&0!R70+!&10#97(&+#\*1!('&57'6!
A%'/'!&/+##\$#&(!#1+'(#5'1\$'!&12!2#0+/#=7+'2!\$\*9:7+#15!A&0!+%'!-\*\$700!!8'/'!
'('@'110':&/&+'!+%/\*&20!\*-!'B'\$7+#\*16!+?:#\$&((?!\$\*9#15!-/\*9!'('@'1!0':&/&+'!)
\$\*9:7+'/0!A'/'!\$\*11'\$+'2!+\*!+%'!&0\*\$\$'/!0'/@'/L!#1!&!\$(#'1+!0'/@'/!-&0%#\*10!!H%'!)
/'&(#09!\*-!+%#010#97(&+#\*1!('&57'!\$\*1+#17'0!+\*!5/\*A!+\*!&((\*Al-\*/!\$\*&\$%!#1+'/&\$+#\*1!)
70#15!:/'2'-#1'2!\$\*99&1200!!;1!&22##\*1!+%'/'!&/'!+%/''!/\*=\*+!P09&((6!9'2#796!)
&12!(&/5'0!('&57'00!!8\*A'@'/6!+%'!1&+7/'!\*-!+%#0!('&57'!#0!#1%'/'1+(?!71-&#/!#1!+%&+!)
/\*=\*#\$12'0#51!#0!('-+!7:!+\*!+%'!+'&906!/'07(##15!\*-+'1!#1!(&/5'(?!='++'/!+'&90!#1!)
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?'&/C!!;+!#0!+%'#/!d#0#\*1!, ?0+'9L0!2'0#51!P-/\*9!MNNMQ!+%&+!;!&++'9:+'2!+\*!

#9:('9'1+C!!H%'/'!&/'!9&1?!-'&+7/'0!\*-!+%'#/!2'0#51!A%#\$%!9&G'!(&+'/6!%#5%'/!

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9&G#15!-&O+'/6!&12!9\*/'!:/'\$#0'C!!!

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\*-!K'A!, \*7+%!W&('0!\*-!, ?21'?!.70+/&(#&!%&0!=''1!&!-\*/\$'!#1!+%'!2'@'(\*:9'1+!\*-! 
-&0+'/!A&(G#15!9'\$%&1#09!-\*/!+%'!2\*50I+%'?!&/'!#1%'/'1+(?!0(\*A6!'&0#(?!+\*!:70%! 
\*@'/6!&12!5'1'/&(((?!2#--#\$7(+!+\*!:/\*5/&9C!!H%'#/!#9:/\*@'9'1+0!&12!2'0#51!-\*/!+%'! 
MNNN!>\*=\*\$7:!&/'!9?!=&0#0!-\*/!#9:('9'1+&+#\*1!\*-!A&(G#15!\$\*2'C!!H%'#/!70'!\*-! 
\*91#!2#/'\$+#\*1&(!9'+%\*20!:/\*@#2'0!&!/'9\*+'!(#G'!#1+'/-&\$'!-\*/!+%'!&/+#-#\$#&(! 
#1+'((#5'1\$'!:\*/+#\*1!\*-!+%'!0?0+'9!&12!+/#'0!+\*!9#1#9#0'!#+0!\*A1!'--'\$+!\*1!+%'! 
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+'&90!A'/'!$*9#150!!;1+'/F0E7&2!$*9:'+#+#*1!0''9'2!+*!#12#$&+'!&1!
#9:/*@'9'1+!#1!:(&?6!=7+!+*!70'!%79&10!5#@'0!&!0*9'A%&+!$*10#0+'1+!:*#1+!*-!
$* 9 : &/#0 * 10!!;1!MNNU!+% ' !%7 9 & 10! A ' / '!2 ' - ' &+ ' 2!- * /!+% ' !-#/0+!+# 9 ' !=?!+% ' !&/+#-#$#&(!
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*-!4 * 9 : 7+'/!, $#'1$'!+%/*75%!$ * 9 : '+#+#*16!=7+!#+0!7(+# 9 &+ '!5 * &(!#0!+*!$ * 9 : '+'!A#+%!
&$+7&(!%79&10!#1!&!/'&(!5&9'!*-!0*$$'/!A#+%!(&/5'!%79&1*#2!/*=*+00:!!.(+%*75%!
+%'!-#'(2!*-!/*=*+#$0!#0!+%'!(&55#15!0'$+#*1!*-!+%'!9&1?!-#'(2'2!/'0'&/$%!*-!
> *= *$7:6!#+!#0!% *: '2!+%&+!+% '0'!@'1+7/'0!#1!&/+#-#$#&(!#1+'((#5'1$'6!2#0+/#=7+'2!
2'$#0#*1!9&G#156!&12!@#0#*16!A#((!('&2!+*!-&0+'/!712'/0+&12#15!*-!A%&+!#0!1''2'2!
-/* 9!+%'!/*=*+0!#1!*/2'/!+*!='!07$$'00-7(!&12!&(0*!+*!2'+'/9#1'!%*A!+*!+'&$%!
/*=*+0!+*!A*/G!&0!#1!5/*7:06!+%&+!2*!1*+!%&@'!&!e9&0+'/L!2*5!2#$+&+#15!A%&+!1''20!
+*!='!1'B+6!!H%'0'!#2'&0!$/'&+'!%79&1!(#G'!&=#(#+#'0!#1!'&$%!/*=*+6!&12!G'':!
2':'12'1$#'0!&0!(*A!&0!:*00#=('0!!H%'0'!&=#(#+#'0!$&1!+%'1!='!70'2!#1!*+%'/!
&/'&06!&0!1''2'26!+*!&#2!#1!='++'/!(#-'0+?('0!-*/!&((C!
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-*/A&/2!&+!'#5%+?!-#@'!9#((#9'+'/0!:'/!0+':6!A#+%!0'/*!9*+#*1!+*!+%'!('-+6!&12!0'/*!

9*+#*1!#1!&!$#/$7(&/!-&0%#*1!P#C'C!+%'!/*+&+#*1!*-!+%'!'1+#/'!/*=*+0C

!;1!*/2'/!+*!@'/#-?!+%&+!+%'0'!:&/&9'+'/0!&12!0?0+'9!A*/G'26!;!%&2!+*!

$/'&+'!&!A&?!+*!&$$'00!+%'!9*27('!#1!+%'!/*=*+6!&12!+%70!$/'&+'2!&1!'B+'10#*1!+*!

+%'!+'(1'+!0'/@'/!+%&+!A&0!A/#++'1!=?!,*1?!&12!-/''(?!2#0+/#=7+'20!!;!$*7(2!+%'1!

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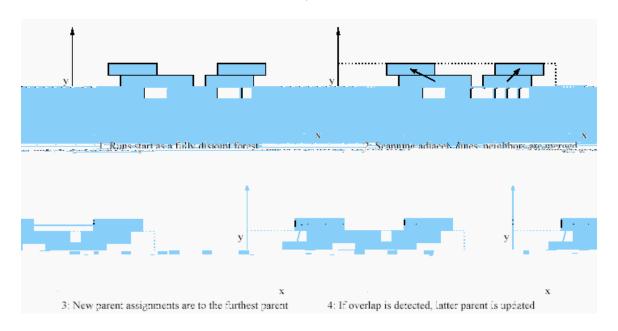
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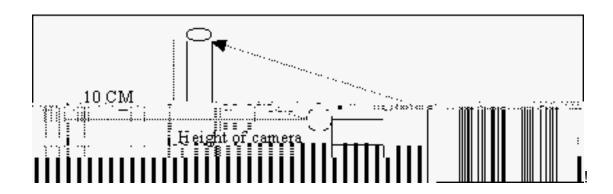
#1+'/'O+!\*-!:'/\\&:0!(\*\\$\&+#15!\&1!\&\\$+7\&(!\*=\R'\\$+!(\#G'!+\%'!=\&((\6!5\*\&(\6!\*/!(\&12.9\&/GC!!;!))))

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VN\_NFVN\_h0!

kpI!W#((#&9!S+%'/6!, \$\*++!Y'10'/6!b&9'0!3/7\$'6! "&/+#1!8\*\$G6!&12! "&7'(&!@'(\*0\*0!!

 $\label{eq:kinequality} $$k`I! " \&\&?\&1!>*+\%!D*75(\&0!d\&\#(6!\&12! " \&17'(\&!d'(*0*0!! . !W*/(2! " *2'(!-*/! " 7(+\#F)))))) $$$ 

```
q!4*:?/#5%+!MNNM!, *1?!4*/:*/&+#*1!!
q!
q!J'/9#00#*1!+*!70'6!$*:?6!9*2#-?6!&12!/'2#0+/#=7+'!+%#0!0*-+A&/'!-*/!
q!1*1F$*99'/$#&(!70'!#0!%'/'=?!5/&1+'20!
q!
q!H%#0!0*-+A&/'!#0!:/*@#2'2!r&0!#0r!A#+%*7+!A&//&1+?!*-!&1?!G#126!
q! '#+% ' /! 'B: / '00 '2!*/!#9: (# '26!#1$(72#15!=7+!1*+!(#9#+ '2!+*!+% '!
q!#9:(#'2!A&//&1+#'0!*-!-#+1'00!-*/!&!:&/+#$7(&/!:7/:*0'0!
q!
1
J > T; s t 70/(*$&(< J) K^>^, D]!
;K,H.YYD;>t0\",!
4 s s t uPJ > ) T; sQ = 11.9 : 0 ' (F(#17BF5 v v!) 
, H>;JtuPJ>)T;sQ\=#1\9#:0'(F(#17BF0+/#:!
" ] 3; K t uPJ > ) T; sQ < J ) K^>\=#1\9 G=#1!
, HS3c)KtuPJ>)T;sQ<J)K^>=#1\0+7=5'1M!
" ]3;KTY.c, tF:!uPJ>)T;sQ!
Y;3, tF(<=R'$+4*99!F(<J)K>!
4ssTY.c,t!w!
      F:#:'!w!
      F < M!w!
      F:C!w!
      F;uPJ > T;sQ < J K^> #1$(72' > NNN!w!
      F;uPJ > T;sQ < J K^{+1}(72'!)
H. > c)Ht/*=*+C=#1!
", D;> t \cdot (\&0\%!)
K, H. YY < 3b, tuPH. > c) HQ!w!
      CC\&$+7&+*/O\&$+7&+*/C=#1!w!
      CC\0'10*/0\0'10*/C=#1!w!
      CC\, *712J(&?\, *712J(&?\012:(&?C=#1!w!
       q!C(\; 9 &5 ' d# ' A ' \bJ ) c ) 1 $*2 ' \R: '5 ' 1 C=#1!
;K,H.YY"n4T,t00\$*1-\$&9'/&0$-!w!
      CC\$*1-\9?$*(*/C$-!w!
      CC\$ * 1-\jC$2+!!
;K,H.YY4Tc,t$*11'$+C$-5!*=R'$+C$-5!2'0#512=C$-5!
q!
q!W%'1!<J)K>^D)3Sc!#0!2'-#1'26!<,n,D)3ScPQ!#0!&@&#(&=('C!
q4ssTY.c,vt!FD<J)K>^D)3Sc!
CJ8 < Kng!&((!#10+&((!$('&1!
```

```
&((q!/*=*+C=#1!)
#10+&(( 9 0g!&((!
      P$2!\&\$+7\&+*/0i! ux " . ] ) y\Q!
                                  ux " . ] ) yQ!
      P$2!CC\0'10*/0i!!
      P$2!C\J*A'/"*1#+*/\J*A'/"*1#+*/i!
                                              ux " . ] ) yQ!
             P$2!\(\Cappa\); 9 & 5 ' d#' A ' \(\rangle\)J ) c ) 1$*2 ' \(\rangle\)!
                                                              ux " . ] ) yQ!
                                                     !
       $:!F/!uPJ>)T;s0\<J)K^>\",\W4<K,<Y)\1*9'9:/*+\<J)KF>!
uP ", D;>Q!
      : |uP;K,H.YY<3b,Q|uP",D;>Q|<J)KF>|W|<3b,|
       $:!CC\J*A'/"*1#+*/\J*A'/"*1#+*/\:*A'/"*1#+*/C=#1!uP", D;>Q\<J) KF
> " W\<3b,\J<W)> " <K\Omega3;K!
       $:!uP;K,H.YY4Tc,Q!uP",D;>Q\<J)KF>\"W\4<KT\!
      : A(\&1*1-C+B+!uP", D;>Q<J)KF>\, n, H) "\4<KT\!
       9G2\#/F: uP ", D;>Q\< J) KF>\. JJ\4 < KT\!
      $:!F/!C\, *712J(&?\, *712J(&?\A&@!uP ", D;>Q\!
      $:!uP;K,H.YY"n4T,Q!uP",D;>Q\!
z C*g! z C$$!
!
      uP4ssQ!uP4ssTY.c,Q!F*!u { !F$!u|!
/*=*+C=#1q!, %**+'/, +7=C*!, %**+'/C*!=(*=C*!Y*&2H=(C*!Y*&24DHC*!
4&9'/&J&/&9(*!!>*=*+(*!/*=*+(*$-!
      uP " ]3;KQ!uP " ]3;KTY.c,Q!F*!u { !u|!uPY;3,Q!
!
      uP, H>;JQ!u {!
      50#:!u { ! } }!9@!u { C50!u { !
#10+&((g!/*=*+C=#1!
      $:!/*=*+C=#1!uP;K,H.YYD;>Q\<J)KF>\"W\<3b,\4.")>.C3;K!
$('&1g!
      /9!F-!jC*!jC=#1!jC'(-!jCO1&:C$$!
      /9!F-!, % * * + ' /, +7=C$$!, % * * + ' /, +7=C%!2 '-C%! ' 1+/?C%!
      /9!F-!uP;K,H.YYD;>0<J)KF>\"W<3b,\4.\")>.03;K!
!
, % * * + ' / , +7=C$$g!O+7=C$-5!
      uP, HS3c) KQ!0+7=C$-5!
, % * * + ' /C * q! , % * * + ' /C$$! , % * * + ' /C%!CC\(#=\> * = * +C%!
      uP4ssQ!uP4ssTY.c,Q!F$!,%**+'/C$$!
> *= *+C*q!CC\(#=\> *= *+C$$!CC\(#=\> *= *+C%!CC\(#1$(72 \D> s`NNC%!CC\(#1$(72 \D> s))
CC\(#=\Y * &2H=(C%!CC\(#=\Y * &24DHC%!
!
      uP4ssQ!uP4ssTY.c,Q!F$!CV(#=\) *=*+C$$!
Y*&2H=(C*g!CC\(#=\Y*&2H=(C$$!CC\(#=\Y*&2H=(C%!
```