

# **ARTS2908**

DfYa cXYfb >UdUb. GHJh gž GYI 'UbX Dck Yf

HYfa 'C bY''##'&\$&%

# 7ci fgY<sup>\*</sup>Cj Yfj ]Yk

# GHJZZ:7cbHJWhi8YHJ]`g

# 7cbj Ybcfg

B Ua Y	9a U]`	5j U]`UV]`] <b>m</b>	@cWJhjcb	D\cbY
8 f'GU``m'A W@UfYb	gU``m'a WUfYb4 i bgk "YXi "Ui	j ]U <sup>.</sup> 9a U]`		

# GWXcc`7cbHJWhi±bZcfa Uhjcb

GWkcc``cZ<iaUb]hjYg'UbX'@Ub[iU[Yg

@c\WUhjcb. G\Wcc``C\ZJ\\Yž\A\cfj\Yb^6fck\b^6i\]\X]b[\ž'@Yj\Y``&ž\&),

## 7ci fgY 8YW] g

7 fYX]hDc]bhg \*

### Gi a a UfmcZh\Y'7ci fgY

 $H\g`Wci fgY`cZYfg`U`h\Ya Uh]Wcj Yfj ]Yk `cZ>UdUbYgY`\]ghcfmZca `dfY\]ghcfmhc`h\Y`A Y]^J=a dYf]U`F YghcfUh]cb`cZ% *, ž`]hg`WbhfU``h\Ya Y`VY]b[ `h\Y`\]ghcfmZca `dfY\]ghcfmhc`h\Y`A Y]^J=a dYf]U`F YghcfUh]cb`cZ% *, ž`]hg`WbhfU``h\Ya Y`VY]b[ `h\Y`\]ghcfmzCk ca Ybž`[ YbXYf`UbX`gYI i U`]h]Yg"`5g`h\Y`Wci fgY ]g`YggYbhJU``mU`W`hi fU``UbX`gcWJU``\]ghcfmz`mci `k ]```bchcb`mX]gW gg`h\Y`]XYUg`UbX`gcWJU``dfUWJ\Wg`cZ fi `]b[ `WUggYg`fWJ ]``Uf]ghc\fUUg`UbX`h\Yb`Vi g\]#\Uff]cfg\{Z`Vi hk ]```U`gc`YI Ua ]bY`dcdi `Uf`6i XX\]ga <math>ZZc`_fY`][ ]cbz'dYUgUbhfYVY``]cbz'Wca a cbYf`fYg]ghUbW`z`UbX`UgdYWg`cZdcdi `Uf`W`hi fY''`$ 

### 7 ci fgY @YUfb]b[ Ci hWca Yg

%" 8 Ya cbglfUhY \_bck `YX[ Y cZh\Y \]ghcfmcZdfYa cXYfb >UdUb"

- &" 5bU`mgY`dfYa cXYfb`>UdUbYgY`<]ghcfmih\fci [\`h\Y``Ybg`cZ[YbXYf`UbX`ZYa]b]ghgW\c`Ufg\]d"
- ' " 7 cbgffi Whuf[i a Ybhg uVci hdfYa cXYfb > UdubYgY < ]ghcfm]b k f]fhYb ubX#cf j YfVu Zcfa '
- ("=XYbhZm\_YmXYVUhYg'UbX'WcbWYdhg']b'dfYa cXYfb'>UdUbYgY'\]ghcfm"
- ) " @cWUHY 'UbX 'UbU'mqY 'df]a Ufm'UbX#cf'qYWcbXUfma UHYf]U``fY Yj Ubh'lc 'dfYa cXYfb'>UdUbYqY'\]qhcfm'

#### HYUWX]b[ GhfUhY[]Yg

H\]g`Wci fgY`]bhfcXi W`g`ghi XYbhg`hc`\_YmXYVUhYg`UVci hih\Y`YUf`ma cXYfb`\]ghcfmcZ>UdUbžk ]h\`Ub Ya d\Ug]g`cb`k ca Ybfg`UbX`[YbXYf`\]ghcfm' \di gYg``YWi fYg`hc`hYUW.`WcbhYbhž`UbX`hi hcf]U`g`hc`U`ck ghi XYbhg`hc`X]gW gg`h\Y]f`fYUX]b["'Hi hcf]U``UggYgga Ybhg`UfY`XYg][bYX`Vch\`hc`YbWci fU[Y`ghYUXm Yb[U[Ya YbhfdUff]W]dUh]cb&UbX`hc`UXX`XYdh\`hc`hi hcf]U``X]gW gg]cb`f&l `fYgdcbgYgž'd`i g`X]gW gg]cb ei Ygh]cbg&"'H\Y`fYgYUfW\`dfc`YWh\Y`dg`ghi XYbhg`hc`i bXYfhU\_Y`ghfi Wi fYXž]bXYdYbXYbhfYgYUfW\"

U'[YbYfU`X]gWgg]cb"

 $H\g^{-1}g^{-1}H\Y^{-1}Z\bU^{-1}UggYgga\Ybh^{-1}Z\c f^{-1}UhYbXUbW^{-1}di\fdcgYg^{"}$ 


# FYgci fWyg

DfYgWf]VYX`F Ygci fWYg`

 $5\ ``fYei\ ]fYX`UbX`gi\ dd`Ya\ YbHUfm`Wci\ fgY`fYUX]b[\ g`k\ ]```VY`Uj\ U]`UV`Y`cb`A\ ccX`Y''$ 

FYWca a YbXYX FYgci fWyg

## Gi Va ]gg]cb cZ5ggYgga YbhHUg\_g

## Hi fb]h]b Gi Va ]gg]cb

Image: Ybwei bhyfu'dfcv'ya k \yb'uhhya dhjb[ 'hc'gi va ]hmci f'Ugg][ ba Ybhh\fci [ \ 'Hi fb]h]bž'd'YUgY

Hy'Yd\cby'9| hy'fbu''Gi ddcfhcb'-', ) '' ' ' %cf'Ya U]''h\Ya 'cb'Y! hy'fbu'hy'hgi ddcfh4 i bgk "YXi "Ui "''Gi ddcfh
\ci fg'UfY', .\$\$Ua '-'%\$.\$\$da 'cb'k YY\_XUmg'UbX'-.\$\$Ua '-').\$\$da 'cb'k YY\_YbXg'fl \*) 'XUmg'U'mYUft"'=Z'mci
UfY'i bUV'Y'hc'gi va ]hmci f'Ugg][ ba YbhXi Y'hc'U'ZJi 'hk ]h\ 'Hi fb]h]b'mci 'a Um'Udd'mZcf'Ub'Y! hy'bg]cbž'Vi hmci
a i ghfYhJ]b'mci f'h]W\_Yhbi a VYf'Zfca '9! hy'fbU''Gi ddcfhfU'cb[ 'k ]h\ 'Ubmch\Yf'fy'Yj UbhXcW a Ybhgt'hc
]bWi XY'Ug'Yj ]XYbW' 'hc'gi ddcfhmci f'Y! hy'bg]cb'Udd']WUh]cb"'=Zmci 'Ya U]''9! hy'fbU''Gi ddcfhmci 'k ]'`
Ui hca Uh]WJ'`mfYW']j Y'U'h]W\_Yhbi a VYfZ'Vi h]Zmci 'hY'Yd\cbY'mci 'k ]``bYYX'hc'gdYW]Z]WJ'`mUg\_'Zcf'cbY''
Hi fb]h]b'U'gc'dfcj ]XYg'i dXUhy'g'cb'h\Y]f'gmghYa 'ghUh' g'cb'Hk]hyf''

; YbYfU`mž'UggYgga YbhiHug\_g'a i ghVY'gi Va ]hhYX'Y`YVWfcb]\WJ``mij ]U'Y]h\Yf'Hi fb]h]b'cf'U'A ccX`Y Ugg][ ba Ybh''=b']bgHJb\W'g'k \YfY'h\]g']g'bchdcgg]V`Yž']hk ]```VY'gHJhYX'cb'mci f'\\circ i fgY'g'A ccX`Y'g]hY'k ]h\U`hYfbUh]j Y'gi Va ]gg]cb'XYHJ]`g"

cfi]bZcfa Uhjcbicbi\ckihcigi Va ]hUgg][ ba Ybhgicbi]bYij ]UiA ccXiY.i\hdg.#gh XYbhi bgk "YXi "Ui #\ck! gi Va ]hUgg][ ba Ybha ccXiY

# 5 WUXYa ]W<cbYghmUbX D`U[]Uf]ga

D`U[]Uf]ga i]gii g]b[ih\Yik cfXgicfi]XYUgicZch\YfgiUbXidfYgYbh]b[ih\Ya iUgimci fick b"i=hWJbihU\_Yia Ubm Zcfa gžZfca iXYi]VYfUhYiWXYUh]b[ihciUWW]XYbhU`mWcdm]b[iZfca iUigci fWYik]h\ci hiUW\_bck iYX[Ya Ybh'

IBGK [fcidg'd'U[]Uf]ga ]bhc'h\Y'Zc``ck]b['WUhY[cf]Yg.

• i bXYfgHJbX'mci f'f][\hg'UbX'fYgdcbg]V]`]h]Yg'Ug'U'gh XYbh'Uhil BGK

### 5 WUXYa ]W = DZcfa Uhjcb

: cf'YggYbhJU`'gh XYbh']bZcfa UhJcb'fY`UhJb['hc.

- fYei Yghg Zcf Yl hYbg]cb/
- `UhY`gi Va ]gg]cbg`[ i ]XY`]bYg/
- fYj]Yk cZa Uf\_g/
- I BGK '< YU`h\ 'UbX'GUZYhmdc`]W]Yg/
- YI Ua ]bUh]cb dfcWYXi fYg/
- qdYWJU``Wcbq]XYfUHjcb`]b`H\Y`Yj YbhcZ]``bYgg`cf`a ]gUXj Ybhi fY/
- gh XYbhYei ]mUbX X]gUV]`]m/
- UbX'ch\Yf'YggYbhJU`UWUXYa ]W]bZcfa UhJcbžgYY

\hdg.#k k k "Ufhg"i bgk "YXi "Ui #W ffYbhgh XYbhg#UWJXYa ]W]bZcfa Uh]cb#dfchcWc`g![i ]XY`]bYg#

#### =a U[ Y 7 fYX]h

DcfffU]h ±1/cb cZA i fUgU\_]G\]\_]Vi fP gcSeS] [EZ[] [Tg | gtž'%+h\ 'W'bh fmž'VmHcgU'A ]fgi c\_]f6/k\*%+!%\* - %±"

\fmdg.##Mca a cbg"k \\_]a YX]U"cf[ #k \\_]# ]`Y.HcgUSA ]fmgi c\_]S\$\$%"`d[

#### 7F = 7CG

7F = 7CG Dfc| XYf 7cXY . \$\$\$-,;

#### 5W\_bck `YX[ Ya YbhcZ7ci bhfm

 $K Y : UW\underline{b}ck : YX[Y : h, Y : 6YXY[U : dYcd : Y : k \setminus c : UfY : h, Y : hfUX]h\underline{b}cb : W : ghcX]Ubg : cZh, Y : UbXg : cb : k \setminus JWX : I B G K : Ybg]b[hcb : WUa di g : ]g : cWUhYX"$