

LAMPIRAN A
LISTING PROGRAM

LISTING PROGRAM PADA MICROSOFT VISUAL BASIC 6.0

1. Program Global

```
Option Explicit

Global Const kGravitasi = 9.086           ' Gravitasi Bumi
Global Const kAmuZ = 1.9                  ' Offset Amunisi
Global Const dUmurPeluru = 9
Global Const kTEl = 0.01                  ' Time rate : Elevasi
Global Const kTAz = 0.01                  ' Time rate : Azimuth
GlobalConst kTNaTu = 0.01                 ' Time rate : Naik Turun
GlobalConst kTMaMu = 0.01                 ' Time rate : Maju Mundur
GlobalConst kBitRight = &H1
GlobalConst kBitLeft = &H2
GlobalConst kBitUp = &H4
GlobalConst kBitDown = &H8
GlobalConst kBitMaju = &H10
GlobalConst kBitMundur = &H20
GlobalConst kBitNaik = &H40
GlobalConst kBitTurun = &H80
Global cInputOk As Byte
Global cFiringOk As Byte
Global cAmuOk As Byte
Global cTargetLock As Byte
Global Const kFileDat = "Meriam.txt"
Global Const kDir3D = "..\Media\"
Global Const kDirObyek = "..\Obyek\"
Global Const kDirData = "..\Data\"
Global Const kMaxAmu = 7
Global iAmuNo As Integer
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Global iAmuDelay As Integer
'-- Gerakan Target --
Global Const Xmin = 100
Global Const Xmax = 800
Global Const Ymin = 550
Global Const Ymax = 730
Global Const Vkapal = 5
Global Const Vpswt = 15
'-- DLL Import --
Type TXyzHpr
X As Single           ' X = Absis
Y As Single           ' Y = Ordinat
Z As Single           ' Z = Altitude
H As Single           ' H = Heading
P As Single           ' P = Pitch
R As Single           ' R = Roll
End Type
Type T_Amunisi
bOk As Boolean
dAz As Single         ' Azimuth
dEl As Single         ' Elevasi
dR As Single
dT As Single          ' Time
APos As D3DVECTOR
ARot As D3DVECTOR
AMesh As TVMesh
AXyzHpr As TXyzHpr
End Type
Global aAmunisi(kMaxAmu) As T_Amunisi
Type T_Camera

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sNama As String
dAz As Single           ' Azimuth
dEl As Single           ' Elevasi
dX As Single            ' Posisi X
dY As Single            ' Posisi Y
dZ As Single            ' Posisi Z
End Type

Global oCamera(3) As T_Camera
Global oGun As TXyzHpr
Global oTarget As TXyzHpr
Global oKill As TXyzHpr
Global oTargetAll(1) As TXyzHpr
Global iTrajectOk As Integer
Global iCuramOk As Integer
Global dVpo As Single
Global iCamState As Integer
Global iAzState As Integer
Global iElState As Integer
Global dVp As Single    ' Kecepatan Peluru
Global dVp1 As Single   ' Kecepatan Peluru (Naik/Turun)
Global dVp2 As Single   ' Kecepatan Peluru (Datar)
Global dEl As Single    ' Elevasi Laras
Global dAz As Single    ' Azimuth Meriam
Global dTime As Single  ' Time periode dalam 1 loop
(render)
' -Peluru --
Global bPeluruOk As Boolean
Global dRr As Single, dRx As Single, dRy As Single, dRz
As Single
Global dXx As Single, dYy As Single, dZz As Single

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'-- Variable Alam 3D --
Global MyTV As TVEngine
Global MyScene As TVScene
Global MyTexFactory As TVTextureFactory
Global MyEffects As TVGraphicEffect
Global MyParticle As TVParticleSystem
Global MyLand As TVLandscape
Global MyInp As TVInputEngine
Global MyCamera As TVCamera
Global MyAtmosphere As TVAtmosphere

'-- Joystick --
Type T_Joystick
iAz As Long           ' Azimuth : Left/Right
iEl As Long           ' Elevasi : Up/Dn
iBtn(5) As Byte       ' Zoom : In/Out, Fire :
Y/N, LRF : Mode/Action
iState(5) As Byte     ' 0:Az, 1:El, 2:LRF,
3:Zoom, 4:MC, 5:?
End Type
Global oJoy As T_Joystick
Global bJoystick As Boolean
Global iJsNo As Long
Global iSumJs As Long
Global iSumJsButton As Long
Global iPwmRL As Integer      ' Command : Pwm
(Right and Left)
Global iPwmUD As Integer      ' Command : Pwm (Up
and Dn)
Global JsState As TV_JOYSTATE
Global JsState2 As TV_JOYSTATE

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Global oGameController As TVGameController
Global GameController2 As TVGameController

'-- Suara --
Global oMySound As TVSounds
Global oMySoundE As TVSoundEngine
Global sSuaraTembak As String

'-- Variabel Meriam --
Global oDasar As TVMesh
Global oLaras As TVMesh

'-- Variabel Target --
Global oKapal As TVMesh
Global oPesawat As TVMesh
Global dGerak As Single
Global iGerakK As Integer
Global iGerakP As Integer
Global iTARGETOk As Integer

'-- Simulasi --
Global isRunning As Boolean
Global bAutoOk As Boolean
Global iSkenarioNo As Integer

'-- Variabel Window --
Global oDisplay As F01Main
Global oMenu As F02Menu

```

2. Program Fungsi

```
Option Explicit

'-- Routine : Extended --
Declare Sub PInitReference Lib "CProjectile.dll" (ByVal
iIn As Integer)
Declare Sub PInitMunition Lib "CProjectile.dll" (ByVal
iInTraject As Integer, ByVal iInCuram As Integer, ByVal
dInSpeed As Single)
Declare Sub PGunToTarget Lib "CProjectile.dll" (oPosIn As
TXYZHpr, oPosOut As TXYZHpr)
Declare Sub PGunToKill Lib "CProjectile.dll" (oPosIn As
TXYZHpr, oPosOut As TXYZHpr)
Declare Sub PPosByTime Lib "CProjectile.dll" (ByVal dIn
As Single, oPosOut As TXYZHpr)
'-- Routine : Program START --
Sub Main()
    '-- Posisi Awal (Matematika) --
    PInitData
'-- Setting WINDOWS --
    Set oDisplay = New F01Main
    Set oMenu = New F02Menu
    oMenu.Move 10, 10
    oDisplay.Move 20 + oMenu.Width, 10
    oDisplay.Show
    oMenu.Show
PFileInit
    oDisplay.PMainLoop
    PFileClose
End Sub
```

```

'-- Routine : Inisialisasi Data --
Sub PInitData()
    '-- Camera --
oCamera(0).sNama = "Penembak"
oCamera(1).sNama = "Peninjau"
oCamera(2).sNama = "Peluru"
    '-- Meriam --
dVp = 100                ' Kecepatan peluru (100 m/s)
dEl = 0' Elevasi awal
dAz = 180                ' Azimuth awal
oGun.X = 430             ' Gun
oGun.Y = 30
oGun.Z = 20              ' Tinggi
' Target Kapal
oTargetAll(0).X = 430
oTargetAll(0).Y = 730
oTargetAll(0).Z = 0
oTargetAll(0).H = 90     ' Heading
oTargetAll(0).P = 0
oTargetAll(0).R = 0
' Target Pesawat
oTargetAll(1).X = 430
oTargetAll(1).Y = 730
oTargetAll(1).Z = 200
oTargetAll(1).H = 0
oTargetAll(1).P = -90    ' Pitch
oTargetAll(1).R = 180    ' Roll
oTarget = oTargetAll(0)
    '-- Amunisi --
iAmuNo = 0

```

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cAmuOk = 0
iAmuDelay = 0
    '-- Init DLL --
iTrajectOk = 1                                ' 0=No Trajectory,
1=Using Trajectory
iCuramOk = 0                                ' 0:Landai, 1:Curam
dVpo = dVp
    PInitMunition iTrajectOk, iCuramOk, dVpo
End Sub
'-- Routine : Proses pergerakan peluru --
Sub PInitCamera()
    Dim ii As Integer
    MyCamera.SetPosition 512, 100, 512
    For ii = 0 To 2
oCamera(ii).dX = oGun.X
oCamera(ii).dY = oGun.Y
oCamera(ii).dZ = oGun.Z + 3
oCamera(ii).dAz = 0
oCamera(ii).dEl = 0
    Next
    '-- Peninjau -
oCamera(1).dAz = oCamera(1).dAz - 90
oCamera(1).dX = oTargetAll(0).X + 10
oCamera(1).dY = oTargetAll(0).Y
oCamera(1).dZ = oTargetAll(0).Z + 5
End Sub

```

```

Sub PInitTarget()
    Dim ii As Integer
    '-- MESH --
    Set oKapal = MyScene.CreateMeshBuilder
    Set oPesawat = MyScene.CreateMeshBuilder
oKapal.Load3DSMesh kDirObyek & "Boat.3DS", True, False
oPesawat.Load3DSMesh kDirObyek & "Ship.3DS", True, False
    oKapal.ScaleMesh 0.1, 0.1, 0.1
    oPesawat.ScaleMesh 0.1, 0.1, 0.1
    '-- Texture --
oKapal.SetColor RGBA(0.3, 0.3, 0.3, 1)
oPesawat.SetColor RGBA(0.3, 0.3, 0.3, 1)
    '-- Tampilan 3D : Kapal -
oKapal.SetPosition oTargetAll(0).X, oTargetAll(0).Z,
oTargetAll(0).Y
oKapal.SetRotation oTargetAll(0).P, oTargetAll(0).H,
oTargetAll(0).R
    '-- Tampilan 3D : Pesawat --
oPesawat.SetPosition oTargetAll(1).X, oTargetAll(1).Z,
oTargetAll(1).Y
oPesawat.SetRotation oTargetAll(1).P, oTargetAll(1).R,
oTargetAll(1).H
oKapal.Enable True
oPesawat.Enable False
End Sub

Sub PPilihSkenario()
    If iSkenarioNo = 1 Then
        ' Kapal diam
oKapal.Enable True
oPesawat.Enable False
iGerakK = 0
    
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iGerakP = 0
    ElseIf iSkenarioNo = 2 Then                                ' Pesawat Diam
oKapal.Enable False
oPesawat.Enable True
iGerakK = 0
iGerakP = 0
    ElseIf iSkenarioNo = 3 Then
' Kapal bergerak + Pesawat Diam
oKapal.Enable True
oPesawat.Enable True
iGerakK = 1
iGerakP = 0
    ElseIf iSkenarioNo = 4 Then
' Kapal Diam + Pesawat bergerak
oKapal.Enable True
oPesawat.Enable True
iGerakK = 0
iGerakP = 1
    ElseIf iSkenarioNo = 5 Then
' Kapal bergerak + Pesawat bergerak
oKapal.Enable True
oPesawat.Enable True
iGerakK = 1
iGerakP = 1
    End If
End Sub

```

```

Sub PInitMeriam()
    Dim ii As Integer
    '-- MESH --
    Set oDasar = MyScene.CreateMeshBuilder
    Set oLaras = MyScene.CreateMeshBuilder
    oDasar.Load3DSMesh kDirObyek & "BASE.3DS", True, False
    oLaras.Load3DSMesh kDirObyek & "LARAS.3DS", True, False
    oDasar.ScaleMesh 0.1, 0.1, 0.1
    '-- Texture --
    oDasar.SetColor RGBA(0.1, 0.2, 0.1, 1)
    oLaras.SetColor RGBA(0.1, 0.2, 0.1, 1)
    '-- Parent + Child --
    oDasar.CreateChild
    oDasar.AddChild oLaras
    '-- Posisi Awal --
    oDasar.SetPosition oGun.X, oGun.Z, oGun.Y
    oLaras.SetMeshCenter 0, 20, 0
    oLaras.SetPosition 0, 19, 0
    '-- Amunisi --
    For ii = 0 To kMaxAmu
        With aAmunisi(ii)
            Set .AMesh = MyScene.CreateMeshBuilder
            .AMesh.Load3DSMesh kDirObyek & "AMUNISI.3DS", True, False
            .AMesh.Enable False
            .AMesh.SetColor RGBA(0.1, 0.1, 0.1, 1)
            .AMesh.ScaleMesh 0.1, 0.1, 0.1
            .AMesh.SetMeshCenter 0, 20, -70
            .AMesh.SetPosition oGun.X, oGun.Z + 1.9, oGun.Y
            .bOk = False
        End With
    Next ii
End Sub

```

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Next
End Sub

Sub PJoystickInit()
MyInp.GameControllers.GetControllers
iSumJs = MyInp.GameControllers.Count
bJoystick = IIf(iSumJs > 0, True, False)
    If bJoystick Then
        Set oGameController = MyInp.GameControllers.Item(1)
        oGameController.Initialize
iSumJsButton = oGameController.GetButtonCount
    End If
End Sub

Sub PRendering()
    'Clear the screen
    MyTV.Clear
    'Render the sky (you have to call this method just
after the terrain rendering)
    MyAtmosphere.Atmosphere_Render
    'Render the entire landscape
    MyLand.Render
    'Render the trees and the car
    MyScene.RenderAllMeshes
    'Flip all on the screen
    MyTV.RenderToScreen
End Sub

```

```

'-- Routine : Read Data Joystick --
Sub PJoystickRead()
    Dim ii As Integer
    Dim sTemp As String
    Dim iJx As Long
    Dim iJy As Long
    Static iCountJs As Integer
    ' Update values :
    iCountJs = IIf(iCountJs > 9999, 0, iCountJs + 1)
    oGameController.Poll
    JsState = oGameController.ControllerState
    ' Refresh every renderToScreen
    ' Check Data Joystick
    ' JS : Fire
    If JsState.Buttons(0) Then          ' JS : Fire
cFiringOk = 2
    End If
    '-- Meriam : Elevasi + Azimuth --
    If Not bAutoOk Then                  ' Gerakan : Auto
    If JsState.Y < 4000 Then dEl = dEl + dTime * kTEL
    ' Up
    If JsState.Y > 6000 Then dEl = dEl - dTime * kTEL
    ' Dn
    If JsState.X < 4000 Then dAz = dAz - dTime * kTAz
    'Left
    If JsState.X > 6000 Then dAz = dAz + dTime * kTAz
    ' Right
    End If
End Sub
'-- Routine : Proses Data Joystick --

```

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Sub PJoystickRun()
    If oJoy.iState(3) Then
        ' JS : State
        If oJoy.iState(0) Then          ' Azimuth Run
            iPwmRL = Abs(oJoy.iAz)
            If iPwmRL > 100 Then iPwmRL = 100
        End If
        If oJoy.iState(1) Then          ' Elevation Run
            iPwmUD = Abs(oJoy.iEl)
            If iPwmUD > 100 Then iPwmUD = 100
        End If
    End If
    oJoy.iState(0) = 0
    oJoy.iState(1) = 0
    oJoy.iState(2) = 0
    oJoy.iState(3) = 0
End Sub

'Input keyboard
Sub PDataInput()
    '-- Time per Frame --
    dTime = MyTV.TimeElapsed
    '-- Camera : Viewing --
    If MyInp.IsKeyPressed(TV_KEY_F1) = True Then
        oMenu.PMenuState 0
    If MyInp.IsKeyPressed(TV_KEY_F2) = True Then
        oMenu.PMenuState 1
    If MyInp.IsKeyPressed(TV_KEY_F3) = True Then
        oMenu.PMenuState 2

    '-- Eye : Moving --

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    If MyInp.IsKeyPressed(TV_KEY_RIGHT) = True Then
cInputOk = cInputOk Or kBitRight
    If MyInp.IsKeyPressed(TV_KEY_LEFT) = True Then
cInputOk = cInputOk Or kBitLeft
    If MyInp.IsKeyPressed(TV_KEY_UP) = True Then cInputOk
= cInputOk Or kBitUp
    If MyInp.IsKeyPressed(TV_KEY_DOWN) = True Then
cInputOk = cInputOk Or kBitDown
    If MyInp.IsKeyPressed(TV_KEY_A) = True Then cInputOk =
cInputOk Or kBitMaju
    If MyInp.IsKeyPressed(TV_KEY_Z) = True Then cInputOk =
cInputOk Or kBitMundur
    If MyInp.IsKeyPressed(TV_KEY_S) = True Then cInputOk =
cInputOk Or kBitNaik
    If MyInp.IsKeyPressed(TV_KEY_X) = True Then cInputOk =
cInputOk Or kBitTurun
    '-- Meriam : Elevasi + Azimuth --
    If bAutoOk Then                                ' Gerakan : Auto
        oMenu.PAutoTrack
    Else      ' Gerakan : Manual
    If MyInp.IsKeyPressed(TV_KEY_I) = True Then dEl = dEl +
dTime * kTEl      ' Up
    If MyInp.IsKeyPressed(TV_KEY_K) = True Then dEl = dEl -
dTime * kTEl      ' Dn
    If MyInp.IsKeyPressed(TV_KEY_J) = True Then dAz = dAz -
dTime * kTAz      ' Left
    If MyInp.IsKeyPressed(TV_KEY_L) = True Then dAz = dAz +
dTime * kTAz      ' Right
    End If
    '-- Meriam : Firing --

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If MyInp.IsKeyPressed(TV_KEY_F) = True Then cFiringOk = 2
    '-- Meriam : Manual / Auto --
If MyInp.IsKeyPressed(TV_KEY_M) = True Then      ' Manual
    If bAutoOk Then
bAutoOk = False
        oMenu.PMenuState 10
    End If
End If

If MyInp.IsKeyPressed(TV_KEY_N) = True Then      ' Auto
    If Not bAutoOk Then
bAutoOk = True
        oMenu.PMenuState 9
    End If
End If

If iElState Then                                ' Elevasi berubah
If iElState = 1 Then dEl = dEl - dTime * kTEl    ' Dn
If iElState = 2 Then dEl = dEl + dTime * kTEl    ' Up
End If

If iAzState Then      ' Azimuth berubah
If iAzState = 1 Then dAz = dAz - dTime * kTAz    ' Left
If iAzState = 2 Then dAz = dAz + dTime * kTAz    ' Right
End If

If iAmuDelay Then iAmuDelay = iAmuDelay - 1
If cFiringOk Then PMeriamTembak
    '-- Range --
    If dEl < 0 Then dEl = 0
    If dEl > 87 Then dEl = 87
    If dAz < 0 Then dAz = 360
    If dAz > 360 Then dAz = 0
End Sub

```

```

'-- Routine : Proses pergerakan Meriam--
Sub PMeriamTembak()
cFiringOk = 0
    If iAmuDelay Then Exit Sub
iAmuDelay = 15
iAmuNo = IIf(iAmuNo < 7, iAmuNo + 1, 0)
cAmuOk= cAmuOk Or (2 ^ iAmuNo)      'AmuOk = 1234 5678
    oGun.H = dAz
    oGun.P = dEl
    oGun.R = 0
    With aAmunisi(iAmuNo)
        .dT = 0
        .AXyzHpr = oGun
    .AMesh.SetPosition .AXyzHpr.X, .AXyzHpr.Z, .AXyzHpr.Y
    .AMesh.SetRotation .AXyzHpr.P, .AXyzHpr.H, 0
        .bOk = True
        .AMesh.Enable .bOk
        .APos.X = .AXyzHpr.X
        .APos.Y = .AXyzHpr.Y
        .APos.Z = .AXyzHpr.Z
        .APosOld = .APos
    End With
bPeluruOk = True
oMySound(sSuaraTembak).Play
End Sub

'-- Routine : Proses pergerakan Meriam + Target --
Sub PMeriamMove()
oDasar.SetRotation 0, dAz, 0      ' dAzB=180, saat dAz=0
oLaras.SetRotation dEl, 0, 0
'-- Target --

```

```

If iSkenarioNo < 3 Then
Else
    If iGerakK > 0 Then
        With oTargetAll(0)
dGerak = Vkapal * dTime * 0.001
            If iGerakK = 1 Then                                'Kanan
                .H = 90
                .X = .X + dGerak
                If .X > Xmax Then iGerakK = 2
            ElseIf iGerakK = 2 Then                            'Turun
                .H = 180
                .Y = .Y - dGerak
                If .Y < Ymin Then iGerakK = 3
            ElseIf iGerakK = 3 Then                            'Kiri
                .H = -90
                .X = .X - dGerak
                If .X < Xmin Then iGerakK = 4
            ElseIf iGerakK = 4 Then                            'Naik
                .H = 0
                .Y = .Y + dGerak
                If .Y > Ymax Then iGerakK = 1
            End If
            oKapal.SetPosition .X, .Z, .Y
            oKapal.SetRotation .P, .H, .R
        End With
    End If
    If iGerakP > 0 Then
        With oTargetAll(1)
dGerak = Vpswt * dTime * 0.001
            If iGerakP = 1 Then                                'Kanan

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        .X = .X + dGerak
        If .X > Xmax Then iGerakP = 2
    ElseIf iGerakP = 2 Then                'Turun
        .Y = .Y - dGerak
        If .Y < Ymin Then iGerakP = 3
    ElseIf iGerakP = 3 Then                'Kiri
        .X = .X - dGerak
        If .X < Xmin Then iGerakP = 4
    ElseIf iGerakP = 4 Then                'Naik
        .Y = .Y + dGerak
        If .Y > Ymax Then iGerakP = 1
    End If
    oPesawat.SetPosition .X, .Z, .Y
    oPesawat.SetRotation .P, .H, .R
End With
End If
End If
End Sub

'-- Routine : Proses pergerakan peluru --
Sub PDataPeluru()
    Dim bKenaOk As Boolean
    Dim ii As Integer
    Dim dHo As Double
    Dim dPo As Double

    If bPeluruOk Then
        For ii = 0 To kMaxAmu
            With aAmunisi(ii)
                If .bOk Then
                    .dT = .dT + (dTime * 0.001)

```

```

dHo = Deg2Rad(.AXyzHpr.H + 180)
dPo = Deg2Rad(.AXyzHpr.P)
        dVp1 = dVp * Cos(dPo)
' Kecepatan datar (Vxy)
        dVp2 = dVp * Sin(dPo)
' Kecepatan naik (Vz)
.APos.X = .AXyzHpr.X + (dVp1 * .dT * Sin(dHo))
.APos.Y = .AXyzHpr.Y + (dVp1 * .dT * Cos(dHo))
.APos.Z = .AXyzHpr.Z + (dVp2 * .dT)
If iTrajectOk Then .APos.Z = .APos.Z - (0.5 * kGravitasi
* .dT * .dT)
.AMesh.SetPosition .APos.X, .APos.Z, .APos.Y
If .dT > dUmurPeluru Then ' Waktu habis
        .bOk = False
        .AMesh.Enable .bOk
cAmuOk = cAmuOk And (255 - (2 ^ ii))
bPeluruOk = IIf(cAmuOk, True, False)
oMySound(sSuaraTembak).Play
        Else ' Check Ledakan
bKenaOk = oKapal.Collision(.APosOld, .APos,
TV_TESTTYPE_BOUNDINGBOX) Or _
oPesawat.Collision(.APosOld, .APos,
TV_TESTTYPE_BOUNDINGBOX)
        If bKenaOk Then
                .bOk = False
                .AMesh.Enable .bOk
cAmuOk = cAmuOk And (255 - (2 ^ ii))
bPeluruOk = IIf(cAmuOk, True, False)
oMySound(sSuaraTembak).Play
        End If

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```

        End If
    End With
Next
End If
End Sub

Sub PViewCamera()
    With oCamera(iCamState)
        If cInputOk Then
            If cInputOk And kBitUp Then .dEl = .dEl + dTime * kTEl
            If cInputOk And kBitDown Then .dEl = .dEl - dTime * kTEl
            If cInputOk And kBitRight Then .dAz = .dAz + dTime * kTAz
            If cInputOk And kBitLeft Then .dAz = .dAz - dTime * kTAz
            If cInputOk And kBitNaik Then .dZ = .dZ + dTime * kTNaTu
            If cInputOk And kBitTurun Then .dZ = .dZ - dTime * kTNaTu
        End If

        If iCamState = 0 Then ' Penembak
            MyCamera.ChaseCamera oDasar, Vector(0, 250, 500),
            Vector(0, 0, 0), 50, False, 50
        ElseIf iCamState = 1 Then ' Peninjau
            If cInputOk And kBitMaju Then
                .dX = .dX + Sin(Deg2Rad(.dAz)) * dTime * kTMaMu
                .dY = .dY + Cos(Deg2Rad(.dAz)) * dTime * kTMaMu
            ElseIf cInputOk And kBitMundur Then
                .dX = .dX - Sin(Deg2Rad(.dAz)) * dTime * kTMaMu
                .dY = .dY - Cos(Deg2Rad(.dAz)) * dTime * kTMaMu
            End If

            ' Batasan
            If .dZ < 1 Then .dZ = 1
            If .dEl < -90 Then .dEl = -90
            If .dEl > 90 Then .dEl = 90
        End If
    End With
End Sub

```

```

MyCamera.SetCamera .dX, .dZ, .dY, _
.dX + Sin(Deg2Rad(.dAz)), .dZ + Sin(Deg2Rad(.dEl)), .dY +
Cos(Deg2Rad(.dAz))
    ElseIf iCamState = 2 Then                                ' Peluru
        If bPeluruOk Then
            .dX = aAmunisi(iAmuNo).APos.X
            .dY = aAmunisi(iAmuNo).APos.Y
            .dZ = aAmunisi(iAmuNo).APos.Z + kAmuZ
            .dAz = aAmunisi(iAmuNo).dAz
            .dEl = aAmunisi(iAmuNo).dEl
MyCamera.SetCamera .dX - Sin(Deg2Rad(.dAz)), .dZ -
Sin(Deg2Rad(.dEl)), _
.dY - Cos(Deg2Rad(.dAz)), .dX, .dZ, .dY
Else
MyCamera.SetCamera oGun.X + Sin(Deg2Rad(dAz)), oGun.Z +
kAmuZ + 0.2 - Sin(Deg2Rad(dEl)), _
oGun.Y + Cos(Deg2Rad(dAz)), oGun.X, oGun.Z + kAmuZ + 0.2,
oGun.Y
End If
End If
cInputOk = 0
End With
End Sub

```

3. Program Menu

```
Option Explicit
' Bisa diakses oleh Main
Public Sub PDataAwal()
    TextPos(0).Text = oGun.X
    TextPos(1).Text = oGun.Y
    TextPos(2).Text = oGun.Z
End Sub
Private Sub Form_Load()
    Me.Show
    iSkenarioNo = 1
    ShapeSkenario(iSkenarioNo).BackColor = vbGreen
End Sub
Private Sub LabelMenu_Click(Index As Integer)
    If Index < 3 Then                                ' View Camera
    ElseIf Index < 8 Then                            ' Meriam Move
        If Index = 3 Then                            ' Up
            iElState = IIf(iElState = 2, 0, 2)
        ElseIf Index = 4 Then                        ' Dn
            iElState = IIf(iElState = 1, 0, 1)
        ElseIf Index = 5 Then                        ' Stop
            iAzState = 0
            iElState = 0
        ElseIf Index = 6 Then                        ' Left
            iAzState = IIf(iAzState = 1, 0, 1)
        ElseIf Index = 7 Then                        ' Right
            iAzState = IIf(iAzState = 2, 0, 2)
        End If
    ElseIf Index = 8 Then                            ' Firing
```

```

        ElseIf Index = 9 Then                                ' Auto Track
            If bAutoOk Then Exit Sub
bAutoOk = True
ShapeMenu(13).BackColor = vbYellow
        ElseIf Index = 10 Then                              ' Manual
            If Not bAutoOk Then Exit Sub
bAutoOk = False
ShapeMenu(13).BackColor = vbWhite
        ElseIf Index = 11 Then                              ' Tester
            End If
        PMenuState Index
End Sub

Public Sub PMenuState(ByVal idx As Integer)
    If idx < 3 Then                                          ' View Camera
        ShapeMenu(iCamState).BackColor = vbWhite
        iCamState = idx                                     ' 0=Penembak, 1=Peninjau, 2=Peluru
        ShapeMenu(iCamState).BackColor = vbGreen
        ElseIf idx < 8 Then                                ' Meriam Move
            ShapeMenu(3).BackColor = IIf(iElState = 2, vbGreen,
vbWhite)
            ShapeMenu(4).BackColor = IIf(iElState = 1, vbGreen,
vbWhite)
            ShapeMenu(5).BackColor = IIf(iElState Or iAzState,
vbWhite, vbGreen)
            ShapeMenu(6).BackColor = IIf(iAzState = 1, vbGreen,
vbWhite)
            ShapeMenu(7).BackColor = IIf(iAzState = 2, vbGreen,
vbWhite)
        ElseIf idx = 8 Then                                ' Firing
            ShapeMenu(8).BackColor = vbGreen

```

```

        PFiring
        PMenuState 15
        DoEvents
ShapeMenu(8).BackColor = vbWhite
cFiringOk = 1
ElseIf idx < 11 Then                ' Auto Track / Manual
LabelMenu_Click 5
ShapeMenu(9).BackColor = IIf(bAutoOk, vbGreen, vbWhite)
ShapeMenu(10).BackColor = IIf(bAutoOk, vbWhite, vbGreen)
FrameMenu(1).Enabled = IIf(bAutoOk, False, True)
oTarget = oTargetAll(0)                ' Kapal
cTargetLock = 0
    ElseIf idx = 11 Then                ' Tester
ShapeMenu(11).BackColor = vbGreen
FrameMenu(4).Enabled = True
    ElseIf idx = 15 Then                ' No Tester
ShapeMenu(11).BackColor = vbWhite
FrameMenu(4).Enabled = False
    ElseIf idx = 12 Then                ' Exit
        If isRunning Then
isRunning = False
        Else
            End
        End If
    End If
End Sub
Private Sub LabelSkenario_Click(Index As Integer)
ShapeSkenario(iSkenarioNo).BackColor = vbWhite
iSkenarioNo = Index
ShapeSkenario(iSkenarioNo).BackColor = vbGreen

```

```

        PPilihSkenario
End Sub

Public Sub PFiring()
    PDataTarget
    PDataCalculation
End Sub

Private Sub PDataTarget()
    oGun.H = dAz
    oGun.P = dEl
    oGun.R = 0
    oTarget.H = 0
    oTarget.P = 0
    oTarget.R = 0
End Sub

Private Sub PDataCalculation()
    Dim sTmp As String
    oKill = oTarget
    PGunToKill oGun, oKill
    oKill.H = IIf(oKill.H > 180, oKill.H - 360, oKill.H)
    sTmp = "Gun=[" & Format(oGun.X, "#0.0, ") &
    Format(oGun.Y, "#0.0, ") & Format(oGun.Z, "#0.0]") &
    vbNewLine
    sTmp = sTmp & "Tgt=[" & Format(oTarget.X, "#0.0, ") &
    Format(oTarget.Y, "#0.0, ") & Format(oTarget.Z, "#0.0]") &
    & vbNewLine
    sTmp = sTmp & "Kill=[" & Format(oKill.X, "#0.0, ") &
    Format(oKill.Y, "#0.0, ") & Format(oKill.Z, "#0.0]") &
    vbNewLine
    sTmp = sTmp & "[Az=" & Format(oKill.H, "#0.00, El=") &
    Format(oKill.P, "#0.00]") & vbNewLine

```

```

sTmp = sTmp & "[T=" & Format(oKill.R, "#0.00, R=") &
Format(oGun.R, "#0.00]")
    TextD = sTmp
End Sub

Public Sub PAutoTrack()
    Dim sTmp As String
    Dim dSudut As Single
    If iTargetOk = 0 Then
        '-- Kapal --
oTarget = oTargetAll(0)
        oTarget.H = 0                                ' Vx diam
        If iGerakK = 1 Then
oTarget.H = Vkapal                                ' Vx kanan
        ElseIf iGerakK = 3 Then
oTarget.H = -Vkapal                                ' Vx kiri
        End If
        oTarget.P = 0                                ' Vy
        If iGerakK = 2 Then
oTarget.P = -Vkapal                                ' Vx turun
        ElseIf iGerakK = 4 Then
oTarget.P = Vkapal                                ' Vy naik
        End If
        oTarget.R = 0                                ' Vz
    Else
        '-- Pesawat --
oTarget = oTargetAll(iTargetOk)
        oTarget.H = 0                                ' Vx diam
        If iGerakP = 1 Then
oTarget.H = Vpswt                                ' Vx kanan
        ElseIf iGerakP = 3 Then

```

```

oTarget.H = -Vpswt                                ' Vx kiri
    End If
    oTarget.P = 0                                  ' Vy
    If iGerakP = 2 Then
oTarget.P = -Vpswt                                ' Vx turun
        ElseIf iGerakP = 4 Then
oTarget.P = Vpswt                                ' Vy naik
        End If
        oTarget.R = 0                              ' Vz
    End If
oKill = oTarget
    PGunToKill oGun, oKill
    oKill.H = IIf(oKill.H > 180, oKill.H - 180, oKill.H +
180)
cTargetLock = 0
dSudut = dEl - oKill.P
    If Abs(dSudut) < 0.7 Then
dEl = oKill.P
cTargetLock = cTargetLock Or 1
    Else
dEl = IIf(dSudut > 0, dEl - dTime * kTEl, dEl + dTime *
kTEl)
    End If
dSudut = dAz - oKill.H
    If dSudut > 180 Then dSudut = 360 - dSudut
    If dSudut < (-180) Then dSudut = dSudut + 360

    If Abs(dSudut) < 0.7 Then
dAz = oKill.H
cTargetLock = cTargetLock Or 2

```

```

Else
dAz = IIf(dSudut > 0, dAz - dTime * kTAz, dAz + dTime *
kTAz)
End If
ShapeMenu(13).BackColor = IIf(cTargetLock = 3, vbGreen,
vbYellow)
sTmp = "Gun = [" & CInt(oGun.X) & "," & CInt(oGun.Y) & ","
& CInt(oGun.Z) & "]" & vbNewLine
sTmp = sTmp & "Tgt = [" & CInt(oTarget.X) & "," &
CInt(oTarget.Y) & "," & CInt(oTarget.Z) & "]" & vbNewLine
sTmp = sTmp & "Az = " & Format(oKill.H, "#0.0000") &
vbNewLine
sTmp = sTmp & "El = " & Format(oKill.P, "#0.0000") &
vbNewLine
sTmp = sTmp & "R = " & Format(oGun.R, "#0.00")
TextD = sTmp
End Sub
Private Sub OptionTgt_Click(Index As Integer)
iTargetOk = Index
End Sub

```

4. Program Main

```
Option Explicit
Private Sub Form_Load()
    Me.Show
    PInitModel
    PInitMeriam
    PInitTarget
    PInitCamera
    PJoystickInit
End Sub
Private Sub Form_QueryUnload(Cancel As Integer,
UnloadMode As Integer)
    isRunning = False
End Sub
Private Sub Form_Resize()
    If Not MyTV Is Nothing Then
        MyTV.ResizeDevice
    End If
End Sub
Private Sub LabelMenu_Click(Index As Integer)
    If Index = 0 Then                                ' Exit
        If isRunning Then
            isRunning = False
        Else
            End
        End If
    End If
End Sub
Private Sub PInitModel()
```

```

Set MyTV = New TVEngine
Set MyScene = New TVScene
Set MyTexFactory = New TVTextureFactory
Set MyEffects = New TVGraphicEffect
Set MyParticle = New TVParticleSystem
Set MyLand = New TVLandscape
Set MyCamera = New TVCamera
Set MyInp = New TVInputEngine
    'Show the driver window to allow to select
    'a video mode
'Init the 3D engine with the driver window results.
MyTV.Initialize Me.hWnd
Set MyAtmosphere = New TVAtmosphere
    'Set the default directory for the media files
MyTV.SetSearchDirectory App.Path
    'Load grass texture for the terrain
    'Note that TrueVision3D can load DDS textures.
    'You can create DDS textures with DXTEX delivred with
DirectX8/9 sdk
    'or with TexED delivred with the engine SDK.
MyTexFactory.LoadTexture kDirObyek & "terrain.jpg",
"terrain"
    'Set the general settings for the scene
MyScene.SetSceneBackGround 0, 0, 0
MyScene.SetViewFrustum 90, 1500
    'Load the sky (TrueVision3D can read JPG, BMP, GIF,
DDS, PNG)
MyTexFactory.LoadTexture kDirObyek &
"Sunset\Down.jpg", "down"

```

```

    MyTexFactory.LoadTexture kDirObyek &
"Sunset\Left.jpg", "Left"
    MyTexFactory.LoadTexture kDirObyek & "Sunset\up.jpg",
"up"
    MyTexFactory.LoadTexture kDirObyek &
"Sunset\Right.jpg", "Right"
    MyTexFactory.LoadTexture kDirObyek &
"Sunset\Front.jpg", "Front"
    MyTexFactory.LoadTexture kDirObyek &
"Sunset\Back.jpg", "Back"
    'Apply the sky in the scene
    MyAtmosphere.SkyBox_Enable True
    MyAtmosphere.SkyBox_SetColor 1, 1, 1, 1
    MyAtmosphere.SkyBox_SetDistance 800
    MyAtmosphere.SkyBox_SetTexture GetTex("Front"),
GetTex("Back"), GetTex("Left"), GetTex("Right"),
GetTex("up"), GetTex("down")
    'LANSCAPE CREATION
    MyLand.SetFactoryY 0.4
    MyLand.GenerateHugeTerrain kDirObyek & "height.jpg",
TV_PRECISION_AVERAGE, 4, 4, 0, 0, True
    'For testing the best of the terrain engine try this :
    'MyLand.SetFactoryY 5
    'MyLand.GenerateHugeTerrain "..\..\Media\height.jpg",
TV_PRECISION_AVERAGE, 16, 16, 0, 0, True
    'Change the texture tiling
    MyLand.ExpandTexture GetTex("Terrain"), 0, 0, 4, 4
    Dim MyLightEngine As New TVLightEngine
    Dim li As D3DLIGHT8
    li.Ambient = DXColor(1, 1, 1, 1)

```

```

    li.diffuse = DXColor(1, 1, 1, 1)
    li.Type = D3DLIGHT_DIRECTIONAL
    li.Direction = Vector(-1, -1, 0)
    li.specular = DXColor(0.3, 0.3, 0.3, 1)
    MyLightEngine.CreateLight li
    MyScene.SetSpecularLightning True
' Create sounds
' Sound.LoadSound "drive.wav", , "Driving"
' Sound.Play GetSound("Driving"), True
' Initialize the smoke effect
    MyTexFactory.LoadTexture kDir3D & "smoke.bmp",
"Smoke", 256, 256
    MyParticle.CreateBillboardSystem 50, 0, 10, Vector(0,
0, 0), 0, GetTex("Smoke")
    MyParticle.SetParticleTexture GetTex("Smoke")
    MyParticle.SetParticleAutoGenerateMode True, 0.4, 0.4,
0.4, 0.4, 0.5, 0, 0.1, 0, 0.01, 0.01, 0.01
    MyParticle.SetAlphaBlendingMode TV_CHANGE_ALPHA,
D3DBLEND_SRCALPHA, D3DBLEND_ONE
    '-- Suara Tembakan --
    Set oMySoundE = New TVSoundEngine
oMySoundE.Init hWnd
    Set oMySound = oMySoundE.CreateSounds
sSuaraTembak = "SuaraTembak"
oMySound.AddFile kDirObyek & sSuaraTembak & ".wav"
    MyTV.DisplayFPS = True
    MyTV.SetAngleSystem TV_ANGLE_DEGREE
End Sub
Public Sub PMainLoop()

```

```

    Dim CamPosX As Single, CamPosZ As Single, ang2 As
Single, ang3 As Single, PosY1 As Single
    Dim PosY2 As Single, Speed As Single
    Dim sDebug As String
    'Game loop
isRunning = True
    Do Until MyEffects.FadeFinished = True And isRunning =
False Or MyInp.IsKeyPressed(TV_KEY_ESCAPE) = True
        '-- Proses Rendering --
        PRendering
        '-- Proses Input --
        PDataInput
        If bJoystick Then                                ' Joystick
            PJoystickRead
            PJoystickRun
        End If
        '-- Proses Meriam bergerak --
        PMeriamMove
        '-- Proses View Camera --
        PDataPeluru
        PViewCamera
        '-- Debug Only --
sDebug = "Az = " & dAz & vbNewLine & "El = " & dEl &
vbNewLine
sDebug = sDebug & "Meriam = " & CInt(oGun.X) & ":" &
CInt(oGun.Y) & ":" & CInt(oGun.Z) & vbNewLine
        With oCamera(iCamState)
sDebug = sDebug & .sNama & " = [" & CInt(.dX) & "," &
CInt(.dY) & "," & CInt(.dZ) & _

```

```

        "]" - [ " & Cint(.dAz) & "," & Cint(.dEl) & "]"
& vbNewLine
    End With
    If bPeluruOk Then
        With aAmunisi(0).APos
sDebug = sDebug & "Amunisi = " & Cint(.X) & ":" &
Cint(.Y) & ":" & Cint(.Z) & vbNewLine
        End With
    End If
    TextD = sDebug
    DoEvents
    Loop
    Set MyTV = Nothing
    End
End Sub
Public Sub PDebugJs(ByVal sData As String)
    TextJs = sData
End Sub
Private Sub TextD_Change()
End Sub

```