INTERNATIONAL STANDARD

ISO/IEC 13522-8

First edition
2001-05-15

Information technology — Coding of multimedia and hypermedia information —

Part 8: XML notation for ISO/IEC 13522-5

Technologies de l'information — Codage de l'information multimédia et hypermédia —

Partie 8: Notation XML pour l'ISO/CEI 13522-5

Reference number
ISO/IEC 13522-8:2001(E)

© ISO/IEC 2001

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO/IEC 2001

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

--`,,`,,`-`-`,,`,,`,`,,`---

:: © ISO/IEC 2001 – All rights reserved
Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS Not for Resale

Contents

Page

Foreword iv
Introduction v
1 Scope 1
2 Conformance 1
3 Normative references 1
4 Terms and definitions 1
5 Symbols and abbreviated terms 2
6 Structure 2
7 Requirements 2
Annex A (normative) **XML DTD for ISO/IEC 13522-5** 3
A.1 DTD 3
Annex B (informative) **Sample objects coded in XML** 18
B.1 Introduction 18
B.2 Application object 18
B.3 Scene object 19
Annex C (informative) **DTD validation** 20

© ISO/IEC 2001 – All rights reserved

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO/IEC 13522 may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 13522-8 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*. It is based on the normative content of ISO/IEC 13522-5:1997, in constituting a new notation of MHEG-5 classes.

ISO/IEC 13522 consists of the following parts, under the general title *Information technology — Coding of multimedia and hypermedia information*:

— *Part 1: MHEG object representation — Base notation (ASN.1)*

— *Part 3: MHEG script interchange representation*

— *Part 4: MHEG registration procedures*

— *Part 5: Support for base-level interactive applications*

— *Part 6: Support for enhanced interactive applications*

— *Part 7: Interoperability and conformance testing for ISO/IEC 13522-5*

— *Part 8. XML Notation for ISO/IEC 13522-5*

Annex A forms a normative part of this part of ISO/IEC 13522. Annexes B and C are for information only.

© ISO/IEC 2001 – All rights reserved
Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Introduction

This part of ISO/IEC 13522 specifies a third formal notation based on XML for ISO/IEC 13522-5:1997.

At present the normative components of ISO/IEC 13522-5:1997 are unambiguously expressed in ASN.1 and EBNF textual Notation. Both of these formats are well known to most software specialists. But it is thought that the standard would attract a wider user community if a more familiar markup language was used to express the elements of the Standard. XML has been suggested as the appropriate markup language to use because a very large number of WWW authors already use HTML; and both XML and HTML have a common ancestor in SGML. Many applications or application components may be retrieved from the Internet or written by persons who know or use HTML document formats; thus an MHEG-5 engine capable of processing objects expressed in XML would appeal to a wide audience of potential users. Material stored on Intranet servers in XML format might also be easily and quickly inserted into broadcast applications. In addition it is expected that the WWW and MHEG technologies will eventually merge. Hence an XML version of MHEG-5 may be consistent with this process when it begins to take place.

In XML, a DTD (Document Type Definition) defines a verifiable syntax for a class of XML documents. This part of ISO/IEC 13522 expresses a DTD defining a notation for encoding MHEG-5 objects; this DTD is given in Annex A.

© ISO/IEC 2001 – All rights reserved

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

--`,,`,,`-`-`,,`,,`,`,,`---

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

Information technology — Coding of multimedia and hypermedia information —

Part 8:
XML notation for ISO/IEC 13522-5

1 Scope

ISO/IEC 13522-5:1997 specifies two functionally equivalent notations for MHEG-5 objects in Annexes A and B of that document. This part of ISO/IEC 13522 specifies a third functionally equivalent notation for MHEG-5 objects in XML 1.0 ("Extensible Markup Language" as recommended by World Wide Web Consortium, W3C). This specification is unambiguously expressed in the DTD contained in Annex A.

This part of ISO/IEC 13522 in no way invalidates or substitutes for any clauses of ISO/IEC 13522-5:1997.

2 Conformance

This part of ISO/IEC 13522 defines an alternative notation to those defined in Annexes A and B of ISO/IEC 13522-5:1997. Therefore, no new conformance requirements are imposed on ISO/IEC 13522-5:1997.

However the DTD specified in this part of ISO/IEC 13522-5:1997 is required to validate any MHEG-5 application written in XML.

3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 13522. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO/IEC 13522 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO/IEC 13522-5:1997, *Information technology — Coding of multimedia and hypermedia information — Part 5: Support for base-level interactive applications.*

Extensible Markup Language (XML) 1.0, W3C Recommendation, 10th-February-1998.

4 Terms and definitions

For the purposes of this part of ISO/IEC 13522, the terms and definitions given in ISO/IEC 13522-5:1997 and XML 1.0 apply.

© ISO/IEC 2001 – All rights reserved

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

5 Symbols and abbreviated terms

For the purposes of this part of ISO/IEC 13522, the symbols and abbreviated terms given in ISO/IEC 13522-5:1997 and XML 1.0 apply.

6 Structure

Annex A is normative and defines the notation in the form of an XML DTD. Annex B is informative and provides two examples of MHEG-5 objects encoded using this notation. Annex C is informative and provides some information on the XML DTD validation.

7 Requirements

This International Standard has been designed to satisfy the following requirements:

— Provide a functionally equivalent XML notation for MHEG-5 application description.

— Provide a basis for future migration of MHEG-5 technology to the Internet technology.

© ISO/IEC 2001 – All rights reserved
Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Annex A
(normative)

XML DTD for ISO/IEC 13522-5

A.1 DTD

```
<?xml version="1.0" encoding="UTF-8" ?>


<!-- MHEG-8 MHEG XML Document Type Definition -->

<!-- Root element mheg5 -->

<!ELEMENT mheg5  (application | scene)>

<!-- These are integer sub-range declarations -->

<!ENTITY % from0to255 "(0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |
48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |
65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 |
82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 |
99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 |
113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 |
127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 |
141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 |
155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 |
169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 |
183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 |
197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 |
211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 |
225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 |
239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 |
253 | 254 | 255)">

<!ENTITY % from0to100 "(0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |
48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |
65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 |
82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 |
99 | 100)">

<!-- These elements are defined on class Root, which is abstract -->
<!-- class Root itself is not representable directly in XML notation -->

<!ENTITY % oid "objref">
<!ENTITY % root "%oid;">
<!ELEMENT objref EMPTY>
<!ATTLIST objref
   groupid CDATA #IMPLIED
   objnum  CDATA #REQUIRED>
```

--`,,`,,`-`-`,,`,,`,`,,`---
© ISO/IEC 2001 – All rights reserved
Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<!-- These elements are defined on class group, which is abstract -->
<!-- class group itself is not representable directly in XML notation -->

<!ELEMENT stdid  EMPTY>
<!ATTLIST stdid
          jointid  CDATA #FIXED "2"
          mhegstdid  CDATA #FIXED "19">
<!ELEMENT stdversion  EMPTY>
<!ATTLIST stdversion
          value  CDATA #FIXED "1">
<!ELEMENT objectinfo  EMPTY>
<!ATTLIST objectinfo
          info  CDATA #REQUIRED>
<!ELEMENT onstartup  (action)>
<!ELEMENT onclosedown  (action)>
<!ELEMENT origgcpriority  EMPTY>
<!ATTLIST origgcpriority
          value  %from0to255; "127">
<!ELEMENT items  (residentprg | remoteprg | interchgprg | palette | font |
         cursorshape | booleanvar | integervar | ostringvar |
         objectrefvar | contentrefvar | link | stream |
         bitmap | lineart | dynamiclineart | rectangle |
         hotspot | switchbutton | pushbutton | text |
         entryfield | hypertext | slider | tokengroup |
                  listgroup)+>

<!-- This entity is used in Application and Scene classes-->

<!ENTITY % groupobjectreference "groupid CDATA #REQUIRED objnum  CDATA #FIXED '0'">


<!-- Application Class  -->
<!-- Directly representable in XML notation -->

<!ELEMENT application (stdid?, stdversion?, objectinfo?, onstartup?,
                       onclosedown?, origgcpriority?, items?, onspawnclosedown?,
                       onrestart?, defaultattributes?)>
<!ATTLIST application
          %groupobjectreference;>
<!ELEMENT onspawnclosedown  (action)>
<!ELEMENT onrestart  (action)>
<!-- name "defaultfont" is used in place of "font" in ASN.1 and Textual notation to
prevent XML name clash -->
<!ELEMENT defaultattributes  (characterset | backgroundcolour | textchook |
                              textcolour | defaultfont | fontattributes |
                              interchgprgchook|streamchook|bitmapchook|
                              lineartchook|buttonrefcolour|highlightrefcolour|
                              sliderrefcolour)+>
<!ENTITY % colourindex "integer">
<!ENTITY % absolutecolour "octetstring">
<!ENTITY % colour   "%colourindex;|%absolutecolour;">
<!ENTITY % directcfont "octetstring">
<!ENTITY % indirectcfont "objref">
<!ENTITY % fontbody     "%directcfont; | %indirectcfont;">
<!ELEMENT characterset EMPTY>
<!ATTLIST characterset
          value CDATA #REQUIRED>
<!ELEMENT backgroundcolour (%colour;)>
<!ELEMENT textchook EMPTY>
<!ATTLIST textchook
          value CDATA #REQUIRED>
```


Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

© ISO/IEC 2001 – All rights reserved

```
<!ELEMENT textcolour       (%colour;)>
<!ELEMENT defaultfont     (%fontbody;)>
<!ELEMENT fontattributes EMPTY>
<!ATTLIST fontattributes
          value CDATA #REQUIRED>
<!ELEMENT interchgprgchook EMPTY>
<!ATTLIST interchgprgchook
          value CDATA #REQUIRED>
<!ELEMENT streamchook EMPTY>
<!ATTLIST streamchook
          value CDATA #REQUIRED>
<!ELEMENT bitmapchook EMPTY>
<!ATTLIST bitmapchook
          value CDATA #REQUIRED>
<!ELEMENT lineartchook EMPTY>
<!ATTLIST lineartchook
          value CDATA #REQUIRED>
<!ELEMENT buttonrefcolour  (%colour;)>
<!ELEMENT highlightrefcolour  (%colour;)>
<!ELEMENT sliderrefcolour  (%colour;)>


<!-- Scene Class - -->
<!-- Directly representable in XML notation -->

<!ELEMENT scene (stdid?, stdversion?, objectinfo?, onstartup?,
                 onclosedown?, origgcpriority?, items?, inputeventreg, scenecs,
                 aspectratio?, movingcursor?, nextscenes?)>
<!ATTLIST scene
          %groupobjectreference;>
<!ELEMENT inputeventreg EMPTY>
<!ATTLIST inputeventreg
     num  CDATA #REQUIRED>
<!ELEMENT scenecs EMPTY>
<!ATTLIST scenecs
     xscene CDATA #REQUIRED
     yscene CDATA #REQUIRED>
<!ELEMENT aspectratio EMPTY>
<!ATTLIST aspectratio
     width   CDATA #REQUIRED
     height  CDATA #REQUIRED>
<!ELEMENT movingcursor EMPTY>
<!ATTLIST movingcursor
          value (true | false) "false">
<!ELEMENT nextscenes (nextscene)+>
<!ELEMENT nextscene EMPTY>
<!ATTLIST nextscene
          sceneref     CDATA #REQUIRED
          sceneweight  %from0to255;  #REQUIRED>


<!-- These elements are defined on class Ingredient, which is abstract -->
<!-- class Ingredient itself is not representable directly in XML notation -->

<!ENTITY % includedcontent "octetstring">
<!ELEMENT origcontent (%includedcontent; | referencedcontent)>
<!ATTLIST origcontent
       chook CDATA #IMPLIED>
<!ELEMENT referencedcontent EMPTY>
<!ATTLIST referencedcontent
          contentreference  CDATA #REQUIRED
```

© ISO/IEC 2001 – All rights reserved

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
          contentsize       CDATA #IMPLIED
          ccpriority        %from0to255; "127">

<!ENTITY % objectreference "groupid CDATA #IMPLIED
                            objnum CDATA #REQUIRED">

<!-- ingredient parameter entities -->

<!-- the default case -->
<!ENTITY % ingredientparameters1 "initiallyactive (true | false) 'true'
                    shared          (true | false) 'false'">

<!-- used in palette, font, cursorshape, and variable classes -->
<!ENTITY % ingredientparameters2 "initiallyactive (true | false) #FIXED 'true'
                    shared          (true | false) 'false'">

<!-- used in audio, video, and RTGraphics   -->
<!ENTITY % ingredientparameters3 "initiallyactive (true | false) 'true'">


<!-- Link Class -->

<!ELEMENT link (linkcondition, linkeffect)>
<!ATTLIST link
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT linkcondition (eventsource, eventtype, eventdata?)>
<!ELEMENT eventsource EMPTY>
<!ATTLIST eventsource
          groupid CDATA #IMPLIED
          objnum  CDATA #REQUIRED>
<!ELEMENT eventtype EMPTY>
<!ATTLIST eventtype
   type (isdeleted | isrunning | isavailable | isstopped |
              userinput | anchorfired | timerfired | asynchstopped |
              interactioncompleted | tokenmovedfrom | tokenmovedto |
              streamevent | streamplaying | streamstopped |
              countertrigger | highlighton | highlightoff |
              cursorenter | cursorleave | isselected | isdeselected |
              testevent | firstitempresented | lastitempresented |
              headitems | tailitems | itemselected | itemdeselected |
              entryfieldfull | contentavailable | engineevent) #REQUIRED>
<!ELEMENT eventdata (octetstring | boolean | integer)>
<!ELEMENT linkeffect (action)>


<!-- These elements are defined on class Program, which is abstract -->
<!-- class Program itself is not representable directly in XML notation -->

<!ENTITY % prgparameters "name, initiallyavailable?">
<!ELEMENT name  EMPTY>
<!ATTLIST name
          value CDATA #REQUIRED>
<!ELEMENT initiallyavailable EMPTY>
<!ATTLIST initiallyavailable
          value CDATA "true">
<!ELEMENT residentprg (%prgparameters;)>
<!ATTLIST residentprg
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT remoteprg (%prgparameters;, programconnectiontag?)>
```

--`,,`,-`-`,,`,,`,`,,`---

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale
© ISO/IEC 2001 – All rights reserved

```
<!ATTLIST remoteprg
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT programconnectiontag EMPTY>
<!ATTLIST programconnectiontag value CDATA #REQUIRED>
<!ELEMENT interchgprg (origcontent, %prgparameters;)>
<!ATTLIST interchgprg
          %objectreference;
          %ingredientparameters1;>


<!-- Palette Class  -->
<!ELEMENT palette (origcontent)>
<!ATTLIST palette
        %objectreference;
     %ingredientparameters2;>


<!-- Font Class -->
<!ELEMENT font (origcontent)>
<!ATTLIST font
        %objectreference;
     %ingredientparameters2;>


<!-- CursorShape Class  -->
<!ELEMENT cursorshape (origcontent)>
<!ATTLIST cursorshape
        %objectreference;
     %ingredientparameters2;>


<!-- These elements are defined on class Variable, which is abstract -->
<!-- class Variable itself is not representable directly in XML notation -->

<!ELEMENT integervalue EMPTY>
<!ATTLIST integervalue
   origvalue CDATA #REQUIRED>
<!ELEMENT booleanvalue EMPTY>
<!ATTLIST booleanvalue
   origvalue (true | false) #REQUIRED>
<!ELEMENT ostringvalue EMPTY>
<!ATTLIST ostringvalue
   origvalue CDATA #REQUIRED>
<!ELEMENT objectrefvalue EMPTY>
<!ATTLIST objectrefvalue
   groupid CDATA #IMPLIED
   objnum  CDATA #REQUIRED>
<!ELEMENT contentrefvalue EMPTY>
<!ATTLIST contentrefvalue
      origvalue CDATA #REQUIRED>

<!-- subclasses of variable -->

<!ELEMENT booleanvar (booleanvalue)>
<!ATTLIST booleanvar
        %objectreference;
     %ingredientparameters2;>
<!ELEMENT integervar (integervalue)>
<!ATTLIST integervar
        %objectreference;
```

© ISO/IEC 2001 – All rights reserved

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
     %ingredientparameters2;>
<!ELEMENT ostringvar (ostringvalue)>
<!ATTLIST ostringvar
        %objectreference;
     %ingredientparameters2;>
<!ELEMENT objectrefvar (objectrefvalue)>
<!ATTLIST objectrefvar
        %objectreference;
     %ingredientparameters2;>
<!ELEMENT contentrefvar (contentrefvalue)>
<!ATTLIST contentrefvar
        %objectreference;
     %ingredientparameters2;>

<!-- Presentable Class is not directly representable in XML-->

<!-- TokenManager Class  -->

<!ENTITY % tokenmanager "movementtable?">
<!ELEMENT movementtable (movement)+>
<!ENTITY % targetelement "integer">
<!ELEMENT movement  (%targetelement;)+>

<!-- TokenGroup Class  -->

<!ELEMENT tokengroup   (%tokenmanager;, tokengroupitems,
                        notokenActionslots?)>
<!ATTLIST tokengroup
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT tokengroupitems  (tokengroupitem)+>
<!ENTITY % avisible "objref">
<!ELEMENT tokengroupitem   (%avisible;, actionslots?)>
<!ENTITY % actionslot  "action | null">
<!ELEMENT actionslots  (%actionslot;)+>
<!ELEMENT null   EMPTY>
<!ELEMENT notokenActionslots  (%actionslot;)+>

<!-- ListGroup Class  -->
<!ELEMENT listgroup (%tokenmanager;, tokengroupitems,
                         notokenActionslots?, positions, wraparound?,
                         multipleselection?)>
<!ATTLIST listgroup
          %objectreference;
          %ingredientparameters1;>
<!ENTITY % position "xyposition">
<!ELEMENT positions (%position;)+>
<!ELEMENT wraparound EMPTY>
<!ATTLIST wraparound
        value CDATA "false">
<!ELEMENT multipleselection EMPTY>
<!ATTLIST multipleselection
          value CDATA "false">

<!-- Two varieties of class Visible, depending on whether subclasses -->
<!-- have content or not-->

<!ENTITY % visiblewithcontent "origcontent, origboxsize,
                         origposition?, origpaletteref?">
<!ENTITY % visiblewithoutcontent "origboxsize,
                         origposition?, origpaletteref?">
```


Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale
© ISO/IEC 2001 – All rights reserved

```
<!ELEMENT origboxsize EMPTY>
<!ATTLIST origboxsize
          xlength CDATA #REQUIRED
          ylength CDATA #REQUIRED>
<!ELEMENT origposition EMPTY>
<!ATTLIST origposition
          xpos CDATA "0"
          ypos CDATA "0">
<!ELEMENT origpaletteref EMPTY>
<!ATTLIST origpaletteref
     groupid CDATA #IMPLIED
     objnum  CDATA #REQUIRED>


<!-- Bitmap Class  -->
<!ELEMENT bitmap (%visiblewithcontent;, tiling?, origtransparency?)>
<!ATTLIST bitmap
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT tiling EMPTY>
<!ATTLIST tiling
          value CDATA "false">
<!ELEMENT origtransparency EMPTY>
<!ATTLIST origtransparency
          value %from0to100; "0">


<!-- Entity used by class Lineart and some subclasses-->

<!ENTITY % lineartbody "origlinewidth?, origlinestyle?,
                        origreflinecolour?, origreffillcolour?">

<!-- LineArt Class -->

<!ELEMENT lineart (%visiblewithcontent;, bbbox?, %lineartbody;)>
<!ATTLIST lineart
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT bbbox EMPTY>
<!ATTLIST bbbox
        value (true | false) "true">
<!ELEMENT origlinewidth EMPTY>
<!ATTLIST origlinewidth
        value CDATA "1">
<!ELEMENT origlinestyle EMPTY>
<!ATTLIST origlinestyle
        type (solid | dashed | dotted) "solid">
<!ELEMENT origreflinecolour (%colour;)>
<!ELEMENT origreffillcolour (%colour;)>

<!-- Rectangle Class -->
<!ELEMENT rectangle (%visiblewithoutcontent;, %lineartbody;)>
<!ATTLIST rectangle
          %objectreference;
          %ingredientparameters1;>

<!-- DynamicLineArt Class -->
<!ELEMENT dynamiclineart (%visiblewithoutcontent;, bbbox?, %lineartbody;)>
<!ATTLIST dynamiclineart
          %objectreference;
          %ingredientparameters1;>
```

© ISO/IEC 2001 - All rights reserved

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<!-- Enitity used by Text Class and subclasses Entryfield and Hypertext -->

<!ENTITY % textbody "%visiblewithcontent;, originalfont?, fontattributes?,
          textcolour?, backgroundcolour?, characterset?,
                    hjustification?, vjustification?, lineorientation?,
                    startcorner?, textwrapping?">


<!-- Text Class -->

<!ELEMENT text (%textbody;)>
<!ATTLIST text
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT originalfont    (%fontbody;)>
<!ELEMENT hjustification EMPTY>
<!ATTLIST hjustification
   type (start | end | centre | justified) "start">
<!ELEMENT vjustification EMPTY>
<!ATTLIST vjustification
   type (start | end | centre | justified) "start">
<!ELEMENT lineorientation EMPTY>
<!ATTLIST lineorientation
   type (vertical | horizontal) "horizontal">
<!ELEMENT startcorner EMPTY>
<!ATTLIST startcorner
   type (upper-left | upper-right | lower-left | lower-right) "upper-left">
<!ELEMENT textwrapping EMPTY>
<!ATTLIST textwrapping
          value (true | false) "false">

<!-- Stream Class  -->
<!ELEMENT stream (origcontent, multiplex, storage?, looping?)>
<!ATTLIST stream
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT multiplex (audio | video | rtgraphics)+>
<!ELEMENT storage EMPTY>
<!ATTLIST storage
   type (memory | stream) "stream">
<!ELEMENT looping EMPTY>
<!ATTLIST looping
          value CDATA "1">

<!-- Audio Class -->
<!ELEMENT audio (componenttag, origvolume?)>
<!ATTLIST audio
          %objectreference;
          %ingredientparameters3;>
<!ELEMENT componenttag EMPTY>
<!ATTLIST componenttag
          value CDATA #REQUIRED>
<!ELEMENT origvolume EMPTY>
<!ATTLIST origvolume
          value CDATA "0">

<!-- Video Class -->
<!ELEMENT video (origboxsize, origposition?, componenttag, termination?)>
<!ATTLIST video
```


© ISO/IEC 2001 – All rights reserved
Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
          %objectreference;
          %ingredientparameters3;>
<!ELEMENT termination EMPTY>
<!ATTLIST termination
   type (freeze | disappear) "disappear">

<!-- RTGraphics Class  -->
<!ELEMENT rtgraphics (origboxsize, origposition?, origpaletteref?, componenttag,
termination?)>
<!ATTLIST rtgraphics
          %objectreference;
          %ingredientparameters3;>

<!-- Interactible Class  -->
<!ENTITY % interactible"engineresp?, highlightrefcolour?">
<!ELEMENT engineresp EMPTY>
<!ATTLIST engineresp
          value (true | false) "true">

<!-- Slider Class  -->
<!ELEMENT slider (%visiblewithoutcontent;, %interactible;, orientation, maxvalue,
         minvalue?, initialvalue?, initialportion?, stepsize?,
         sliderstyle?, sliderrefcolour?)>
<!ATTLIST slider
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT orientation EMPTY>
<!ATTLIST orientation
   type (left | right | up | down) #REQUIRED>
<!ELEMENT maxvalue EMPTY>
<!ATTLIST maxvalue
          value CDATA #REQUIRED>
<!ELEMENT minvalue EMPTY>
<!ATTLIST minvalue
          value CDATA "1">
<!ELEMENT initialvalue EMPTY>
<!ATTLIST initialvalue
          value CDATA #REQUIRED>
<!ELEMENT initialportion EMPTY>
<!ATTLIST initialportion
          value CDATA #REQUIRED>
<!ELEMENT stepsize EMPTY>
<!ATTLIST stepsize
          value CDATA "1">
<!ELEMENT sliderstyle EMPTY>
<!ATTLIST sliderstyle
   type (normal | thermometer | proportional) "normal">

<!-- EntryField Class  -->
<!ELEMENT entryfield (%textbody;, %interactible;, inputtype?,
                      charlist?, obscuredinput?, maxlength?)>
<!ATTLIST entryfield
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT inputtype EMPTY>
<!ATTLIST inputtype
   type (alpha | numeric | any | listed) "any">
<!ELEMENT charlist EMPTY>
<!ATTLIST charlist
          value CDATA #REQUIRED>
<!ELEMENT obscuredinput EMPTY>
```

© ISO/IEC 2001 – All rights reserved

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<!ATTLIST obscuredinput
          value CDATA "false">
<!ELEMENT maxlength EMPTY>
<!ATTLIST maxlength
          value CDATA "0">

<!-- HyperText Class  -->
<!ELEMENT hypertext (%textbody;, %interactible;)>
<!ATTLIST hypertext
          %objectreference;
          %ingredientparameters1;>

<!-- Button Class  -->
<!ENTITY % button "%visiblewithoutcontent;, %interactible;, buttonrefcolour?">

<!-- Hotspot Class  -->
<!ELEMENT hotspot (%button;)>
<!ATTLIST hotspot
          %objectreference;
          %ingredientparameters1;>

<!-- PushButton Class  -->
<!ENTITY % pushbuttonbody "%button;, origlabel?, characterset?">
<!ELEMENT pushbutton (%pushbuttonbody;)>
<!ATTLIST pushbutton
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT origlabel EMPTY>
<!ATTLIST origlabel
          value CDATA #REQUIRED>

<!-- SwitchButton Class  -->
<!ELEMENT switchbutton (%pushbuttonbody;, buttonstyle)>
<!ATTLIST switchbutton
          %objectreference;
          %ingredientparameters1;>
<!ELEMENT buttonstyle EMPTY>
<!ATTLIST buttonstyle
   type (pushbutton | radiobutton | checkbox) #REQUIRED>

<!-- Common Data Types  -->
<!ENTITY % directref "objref">
<!ENTITY % genericobjectreference "%directref;|indirectref">
<!ENTITY % contentref "octetstring">
<!ENTITY % genericcontentreference "%contentref; | indirectref">
<!ENTITY % genericinteger "integer | indirectref">
<!ENTITY % genericboolean "boolean | indirectref">
<!ENTITY % genericoctetstring "octetstring | indirectref">
<!ENTITY % address "%genericoctetstring;">
<!ENTITY % answer "objref">
<!ENTITY % appendvalue "%genericoctetstring;">
<!ENTITY % arcangle "%genericinteger;">
<!ENTITY % availabilitystatusvar "objref">
<!ENTITY % callsucceeded "objref">
<!ENTITY % cellindex "%genericinteger;">
<!ENTITY % clonerefvar "objref">
<!ENTITY % comparisonvalue "newgenericinteger|newgenericboolean|
                            newgenericoctetstring|newgenericobjectreference|
                            newgenericcontentreference">
<!ELEMENT connectiontag (%genericinteger;)>
<!ENTITY % denominator "%genericinteger;">
```


© ISO/IEC 2001 – All rights reserved
Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<!ENTITY % ellipseheight "%genericinteger;">
<!ENTITY % ellipsewidth "%genericinteger;">
<!ENTITY % emulatedeventdata "newgenericinteger|newgenericboolean|
                              newgenericoctetstring">
<!ENTITY % emulatedeventsource "%genericobjectreference;">
<!ENTITY % entrypointvar "objref">
<!ENTITY % forksucceeded "objref">
<!ENTITY % feature "%genericoctetstring;">
<!ENTITY % fillcolourvar "objref">
<!ENTITY % firstitemvar "objref">
<!ENTITY % highlightstatusvar "objref">
<!ENTITY % index "%genericinteger;">
<!ENTITY % infilename "%genericoctetstring;">
<!ENTITY % interactionstatusvar "objref">
<!ENTITY % itemindex "%genericinteger;">
<!ENTITY % itemrefvar "objref">
<!ENTITY % itemstatusvar "objref">
<!ENTITY % itemstoscroll "%genericinteger;">
<!ENTITY % labelvar "objref">
<!ENTITY % lastanchorfiredvar "objref">
<!ENTITY % linecolourvar "objref">
<!ENTITY % linestylevar "objref">
<!ENTITY % linewidthvar "objref">
<!ENTITY % movementidentifier "%genericinteger;">
<!ENTITY % nbofsteps "%genericinteger;">
<!ENTITY % newcachepriority "%genericinteger;">
<!ENTITY % newcolour "newcolourindex|newabsolutecolour">
<!ENTITY % newincludedcontent "%genericoctetstring;">
<!ENTITY % newcontent "%newincludedcontent; | newreferencedcontent">
<!ENTITY % newcounterendposition "%genericinteger;">
<!ENTITY % newcounterposition "%genericinteger;">
<!ENTITY % newcountervalue "%genericinteger;">
<!ENTITY % newcursorshape "%genericobjectreference;">
<!ENTITY % newentrypoint "%genericinteger;">
<!ENTITY % newfirstitem "%genericinteger;">
<!ENTITY % newfontname "newgenericoctetstring">
<!ENTITY % newfontreference "newgenericobjectreference">
<!ENTITY % newfont "%newfontname;| %newfontreference;">
<!ENTITY % newhighlightstatus "%genericboolean;">
<!ENTITY % newinteractionstatus "%genericboolean;">
<!ENTITY % newlabel "%genericoctetstring;">
<!ENTITY % newlinestyle "%genericinteger;">
<!ENTITY % newlinewidth "%genericinteger;">
<!ENTITY % newoverwritemode "%genericboolean;">
<!ENTITY % newpaletteref "%genericobjectreference;">
<!ENTITY % newportion "%genericinteger;">
<!ENTITY % newslidervalue "%genericinteger;">
<!ENTITY % numerator "%genericinteger;">
<!ENTITY % rational "(%numerator;), (%denominator;)?">
<!ENTITY % newspeed "%rational;">
<!ENTITY % newtransparency "%genericinteger;">
<!ENTITY % newvariablevalue "newgenericinteger|newgenericboolean|
                             newgenericoctetstring|newgenericobjectreference|
                             newgenericcontentreference">
<!ENTITY % newvolume "%genericinteger;">
<!ENTITY % new "%genericinteger;">
<!ENTITY % newxposition "%genericinteger;">
<!ENTITY % newyposition "%genericinteger;">
<!ENTITY % opensucceeded "objref">
<!ENTITY % operator "%genericinteger;">
<!ENTITY % outfilename "%genericoctetstring;">
```

© ISO/IEC 2001 – All rights reserved

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<!ENTITY % overwritemodevar "objref">
<!ENTITY % parameter "newgenericinteger|newgenericboolean|
                      newgenericoctetstring|newgenericobjectreference|
                      newgenericcontentreference">
<!ENTITY % portionvar "objref">
<!ENTITY % protocol "%genericoctetstring;">
<!ENTITY % readsucceeded "objref">
<!ENTITY % referencevisible "%genericobjectreference;">
<!ENTITY % runningstatusvar "objref">
<!ENTITY % selectionstatusvar "objref">
<!ENTITY % sizevar "objref">
<!ENTITY % slidervaluevar "objref">
<!ENTITY % startangle "%genericinteger;">
<!ENTITY % storesucceeded "objref">
<!ENTITY % target "%genericobjectreference;">
<!ENTITY % textcontentvar "objref">
<!ENTITY % textdatavar "objref">

<!ENTITY % timerid "%genericinteger;">

<!ENTITY % timervalue "%genericinteger;">
<!ENTITY % tokenpositionvar "objref">
<!ENTITY % transitioneffect "%genericinteger;">
<!ENTITY % triggeridentifier "%genericinteger;">
<!ENTITY % value "%genericinteger;">
<!ENTITY % visiblereference "%genericobjectreference;">
<!ENTITY % volumevar "objref">
<!ENTITY % x "%genericinteger;">
<!ENTITY % x1 "%genericinteger;">
<!ENTITY % x2 "%genericinteger;">
<!ENTITY % xboxsizevar "objref">
<!ENTITY % xcursor "%genericinteger;">
<!ENTITY % xnewboxsize "%genericinteger;">
<!ENTITY % xout "objref">
<!ENTITY % xpositionvar "objref">
<!ENTITY % xscale "%genericinteger;">
<!ENTITY % y "%genericinteger;">
<!ENTITY % y1 "%genericinteger;">
<!ENTITY % y2 "%genericinteger;">
<!ENTITY % yboxsizevar "objref">
<!ENTITY % ycursor "%genericinteger;">
<!ENTITY % ynewboxsize "%genericinteger;">
<!ENTITY % yout "objref">
<!ENTITY % ypositionvar "objref">
<!ENTITY % yscale "%genericinteger;">

<!-- Action Class  -->
<!ELEMENT action (
    activate | add | additem | append | bringtofront |
    call | callactionslot | clear | clone | closeconnection |
    deactivate |delitem | deselect | deselectitem | divide |
    drawarc | drawline | drawoval | drawpolygon | drawpolyline |
    drawrectangle | drawsector | fork | getavailabilitystatus |
    getboxsize | getcellitem | getcursorposition | getenginesupport |
    getentrypoint | getfillcolour | getfirstitem | gethighlightstatus |
    getinteractionstatus | getitemstatus | getlabel | getlastanchorfired |
    getlinecolour | getlinestyle | getlinewidth | getlistitem |
    getlistsize | getoverwritemode | getportion | getposition |
    getrunningstatus | getselectionstatus | getslidervalue |
    gettextcontent | gettextdata | gettokenposition | getvolume |
    launch | lockscreen | modulo | move | moveto | multiply |
```


© ISO/IEC 2001 – All rights reserved
Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    openconnection | preload | putbefore | putbehind | quit |
    readpersistent | run | scalebitmap | scalevideo | scrollitems |
    select | selectitem | sendevent | sendtoback | setboxsize |
    setcachepriority | setcounterendposition | setcounterposition |
    setcountertrigger | setcursorposition | setcursorshape | setdata |
    setentrypoint | setfillcolour | setfirstitem | setfontref |
    sethighlightstatus | setinteractionstatus | setlabel | setlinecolour |
    setlinestyle | setlinewidth | setoverwritemode | setpaletteref |
    setportion | setposition | setslidervalue | setspeed | settimer |
    settransparency | setvariable | setvolume | spawn | step | stop |
    storepersistent | subtract | testvariable | toggle | toggleitem |
    transitionto | unload | unlockscreen )+>

<!-- Elementary Action -->
<!ELEMENT activate (%target;)>
<!ELEMENT add ((%target;), (%value;))>
<!ELEMENT additem ((%target;), (%itemindex;), (%visiblereference;))>
<!ELEMENT append ((%target;), (%appendvalue;))>
<!ELEMENT bringtofront (%target;)>
<!ELEMENT call ((%target;), (%callsucceeded;), (parameters?))>
<!ELEMENT callactionslot ((%target;), (%index;))>
<!ELEMENT clear (%target;)>
<!ELEMENT clone ((%target;), (%clonerefvar;))>
<!ELEMENT closeconnection ((%target;), connectiontag)>
<!ELEMENT deactivate (%target;)>
<!ELEMENT delitem ((%target;), (%visiblereference;))>
<!ELEMENT deselect (%target;)>
<!ELEMENT deselectitem ((%target;), (%itemindex;))>
<!ELEMENT divide ((%target;), (%value;))>
<!ELEMENT drawarc ((%target;), (%x;), (%y;), (%ellipsewidth;),
                  (%ellipseheight;), (%startangle;), (%arcangle;))>
<!ELEMENT drawline ((%target;), (%x1;), (%y1;), (%x2;), (%y2;))>
<!ELEMENT drawoval ((%target;), (%x;), (%y;), (%ellipsewidth;),
                   (%ellipseheight;))>
<!ELEMENT drawpolygon ((%target;), pointlist)>
<!ELEMENT drawpolyline ((%target;), pointlist)>
<!ELEMENT drawrectangle ((%target;), (%x1;), (%y1;), (%x2;), (%y2;))>
<!ELEMENT drawsector ((%target;), (%x;), (%y;), (%ellipsewidth;),
                     (%ellipseheight;), (%startangle;), (%arcangle;))>
<!ELEMENT fork ((%target;), (%forksucceeded;), parameters?)>
<!ELEMENT getavailabilitystatus ((%target;), (%availabilitystatusvar;))>
<!ELEMENT getboxsize ((%target;), (%xboxsizevar;), (%yboxsizevar;))>
<!ELEMENT getcellitem  ((%target;), (%cellindex;), (%itemrefvar;))>
<!ELEMENT getcursorposition ((%target;), (%xout;), (%yout;))>
<!ELEMENT getenginesupport ((%target;), (%feature;), (%answer;))>
<!ELEMENT getentrypoint  ((%target;), (%entrypointvar;))>
<!ELEMENT getfillcolour   ((%target;), (%fillcolourvar;))>
<!ELEMENT getfirstitem   ((%target;), (%firstitemvar;))>
<!ELEMENT gethighlightstatus   ((%target;), (%highlightstatusvar;))>
<!ELEMENT getinteractionstatus   ((%target;), (%interactionstatusvar;))>
<!ELEMENT getitemstatus   ((%target;), (%itemindex;), (%itemstatusvar;))>
<!ELEMENT getlabel   ((%target;), (%labelvar;))>
<!ELEMENT getlastanchorfired   ((%target;), (%lastanchorfiredvar;))>
<!ELEMENT getlinecolour   ((%target;), (%linecolourvar;))>
<!ELEMENT getlinestyle   ((%target;), (%linestylevar;))>
<!ELEMENT getlinewidth   ((%target;), (%linewidthvar;))>
<!ELEMENT getlistitem   ((%target;), (%itemindex;), (%itemrefvar;))>
<!ELEMENT getlistsize   ((%target;), (%sizevar;))>
<!ELEMENT getoverwritemode   ((%target;), (%overwritemodevar;))>
<!ELEMENT getportion   ((%target;), (%portionvar;))>
<!ELEMENT getposition ((%target;), (%xpositionvar;), (%ypositionvar;))>
```

© ISO/IEC 2001 – All rights reserved

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<!ELEMENT getrunningstatus   ((%target;), (%runningstatusvar;))>
<!ELEMENT getselectionstatus   ((%target;), (%selectionstatusvar;))>
<!ELEMENT getslidervalue   ((%target;), (%slidervaluevar;))>
<!ELEMENT gettextcontent   ((%target;), (%textcontentvar;))>
<!ELEMENT gettextdata   ((%target;), (%textdatavar;))>
<!ELEMENT gettokenposition   ((%target;), (%tokenpositionvar;))>
<!ELEMENT getvolume   ((%target;), (%volumevar;))>
<!ELEMENT launch (%target;)>
<!ELEMENT lockscreen (%target;)>
<!ELEMENT modulo ((%target;), (%value;))>
<!ELEMENT move ((%target;), (%movementidentifier;))>
<!ELEMENT moveto ((%target;), (%index;))>

<!ELEMENT multiply ((%target;), (%value;))>
<!ELEMENT openconnection ((%target;), (%opensucceeded;),
                          (%protocol;), (%address;), connectiontag)>
<!ELEMENT preload (%target;)>
<!ELEMENT putbefore ((%target;), (%referencevisible;))>
<!ELEMENT putbehind ((%target;), (%referencevisible;))>
<!ELEMENT quit (%target;)>
<!ELEMENT readpersistent ((%target;), (%readsucceeded;),
                          outvariables, (%infilename;))>
<!ELEMENT run (%target;)>
<!ELEMENT scalebitmap ((%target;), (%xscale;), (%yscale;))>
<!ELEMENT scalevideo ((%target;), (%xscale;), (%yscale;))>
<!ELEMENT scrollitems ((%target;), (%itemstoscroll;))>
<!ELEMENT select (%target;)>
<!ELEMENT selectitem ((%target;), (%itemindex;))>
<!ELEMENT sendevent ((%target;), (%emulatedeventsource;),
                     emulatedeventtype, (%emulatedeventdata;)?)>
<!ELEMENT sendtoback (%target;)>
<!ELEMENT setboxsize ((%target;), (%xnewboxsize;), (%ynewboxsize;))>
<!ELEMENT setcachepriority ((%target;), (%newcachepriority;))>
<!ELEMENT setcounterendposition ((%target;), (%newcounterendposition;))>
<!ELEMENT setcounterposition ((%target;), (%newcounterposition;))>
<!ELEMENT setcountertrigger  ((%target;), (%triggeridentifier;),
                              (%newcountervalue;)?)>
<!ELEMENT setcursorposition  ((%target;), (%xcursor;), (%ycursor;))>
<!ELEMENT setcursorshape  ((%target;), (%newcursorshape;)?)>
<!ELEMENT setdata  ((%target;), (%newcontent;)?)>
<!ELEMENT setentrypoint  ((%target;), (%newentrypoint;))>
<!ELEMENT setfillcolour  ((%target;), (%newcolour;))>
<!ELEMENT setfirstitem ((%target;), (%newfirstitem;))>
<!ELEMENT setfontref  ((%target;), (%newfont;))>
<!ELEMENT sethighlightstatus  ((%target;), (%newhighlightstatus;))>
<!ELEMENT setinteractionstatus  ((%target;), (%newinteractionstatus;))>
<!ELEMENT setlabel  ((%target;), (%newlabel;))>
<!ELEMENT setlinecolour  ((%target;), (%newcolour;))>
<!ELEMENT setlinestyle  ((%target;), (%newlinestyle;))>
<!ELEMENT setlinewidth  ((%target;), (%newlinewidth;))>
<!ELEMENT setoverwritemode  ((%target;), (%newoverwritemode;))>
<!ELEMENT setpaletteref  ((%target;), (%newpaletteref;))>
<!ELEMENT setportion  ((%target;), (%newportion;))>
<!ELEMENT setposition  ((%target;), (%newxposition;), (%newyposition;))>
<!ELEMENT setslidervalue  ((%target;), (%newslidervalue;))>
<!ELEMENT setspeed  ((%target;), (%newspeed;))>
<!ELEMENT settimer ((%target;), (%timerid;), (%timervalue;)?,
                    absolutetime?)>
<!ELEMENT settransparency  ((%target;), (%newtransparency;))>
<!ELEMENT setvariable  ((%target;), (%newvariablevalue;))>
<!ELEMENT setvolume  ((%target;), (%newvolume;))>
```


© ISO/IEC 2001 – All rights reserved
Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<!ELEMENT spawn  (%target;)>
<!ELEMENT step  ((%target;), (%nbofsteps;))>
<!ELEMENT stop (%target;)>
<!ELEMENT storepersistent ((%target;), (%storesucceeded;),
                           invariables, (%outfilename;))>
<!ELEMENT subtract  ((%target;), (%value;))>
<!ELEMENT testvariable  ((%target;), (%operator;), (%comparisonvalue;))>
<!ELEMENT toggle  ((%target;))>
<!ELEMENT toggleitem  ((%target;), (%itemindex;))>
<!ELEMENT transitionto ((%target;), connectiontag?, (%transitioneffect;)?)>
<!ELEMENT unload  (%target;)>
<!ELEMENT unlockscreen  (%target;)>
<!ELEMENT newreferencedcontent ((%genericcontentreference;), newcontentsize?,
newccpriority?)>
<!ELEMENT point ((%x;), (%y;))>
<!ELEMENT pointlist (point)+>
<!ELEMENT absolutetime (%genericboolean;)>
<!ELEMENT emulatedeventtype EMPTY>
<!ATTLIST emulatedeventtype
   type (isdeleted | isrunning | isavailable | isstopped |
              userinput | anchorfired | timerfired | asynchstopped |
              interactioncompleted | tokenmovedfrom | tokenmovedto |
              streamevent | streamplaying | streamstopped | countertrigger |
              highlighton | highlightoff | cursorenter | cursorleave |
              isselected | isdeselected | testevent | firstitempresented |
              lastitempresented | headitems |tailitems | itemselected |
              itemdeselected | entryfieldfull | contentavailable |
              engineevent) #REQUIRED>
<!ELEMENT invariables (objref)+>
<!ELEMENT newabsolutecolour (%genericoctetstring;)>
<!ELEMENT newcolourindex (%genericinteger;)>
<!ELEMENT newccpriority (%genericinteger;)>
<!ELEMENT newcontentsize (%genericinteger;)>
<!ELEMENT outvariables (objref)+>
<!ELEMENT parameters (%parameter;)+>
<!ELEMENT newgenericboolean (%genericboolean;)>
<!ELEMENT newgenericinteger (%genericinteger;)>
<!ELEMENT newgenericoctetstring (%genericoctetstring;)>
<!ELEMENT newgenericobjectreference (%genericobjectreference;)>
<!ELEMENT newgenericcontentreference (%genericcontentreference;)>
<!ELEMENT indirectref EMPTY>
<!ATTLIST indirectref
   groupid CDATA #IMPLIED
   objnum  CDATA #REQUIRED>
<!ELEMENT boolean EMPTY>
<!ATTLIST boolean
        value (true | false) #IMPLIED>
<!ELEMENT integer EMPTY>
<!ATTLIST integer
        value CDATA #REQUIRED>
<!ELEMENT octetstring (#PCDATA)>
<!ATTLIST octetstring
        type (printable | qprintable | base64) "printable">
<!ELEMENT xyposition EMPTY>
<!ATTLIST xyposition
        xposition CDATA #REQUIRED
        yposition CDATA #REQUIRED>
```

--`,,`-`-`,,`,,`,`,,`---

© ISO/IEC 2001 – All rights reserved

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Annex B
(informative)

Sample objects coded in XML

B.1 Introduction

Clauses B.2 and B.3 define MHEG-5 objects in XML notation; they have been validated against the DTD given in Annex A (stored in a file named "mheg5.dtd").

B.2 Application object

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE mheg5 SYSTEM "mheg5.dtd" >

<mheg5>
  <application groupid="app1.xml">
    <items>
      <link objnum="1">
        <linkcondition>
          <eventsource objnum="0"/>
          <eventtype type="isrunning"/>
        </linkcondition>
        <linkeffect>
          <action>
            <transitionto>
              <objref objnum="0" groupid="scene1.xml"/>
            </transitionto>
          </action>
        </linkeffect>
      </link>
    </items>
  </application>
</mheg5>
```


© ISO/IEC 2001 – All rights reserved
Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

B.3 Scene object

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE mheg5 SYSTEM "mheg5.dtd" >

<mheg5>
  <scene groupid="scene1.xml">
    <items>
      <bitmap initiallyactive="true" shared="false" groupid="scene1.xml" objnum="1">
        <origcontent chook="10">
          <referencedcontent contentreference="b1.gif"/>
        </origcontent>
        <origboxsize xlength="640" ylength="480"/>
        <origposition xpos="0" ypos="0"/>
      </bitmap>
      <bitmap initiallyactive="false" shared="false" groupid="scene1.xml" objnum="2">
        <origcontent chook="10">
          <referencedcontent contentreference="b2.gif"/>
        </origcontent>
        <origboxsize xlength="640" ylength="480"/>
        <origposition xpos="0" ypos="0"/>
      </bitmap>
      <link objnum="4">
        <linkcondition>
          <eventsource objnum="0"/>
          <eventtype type="userinput"/>
          <eventdata>
            <integer value="15"/>
          </eventdata>
        </linkcondition>
        <linkeffect>
          <action>
            <stop>
              <objref objnum="2"/>
            </stop>
          </action>
        </linkeffect>
      </link>
      <link objnum="3">
        <linkcondition>
          <eventsource objnum="0"/>
          <eventtype type="userinput"/>
          <eventdata>
            <integer value="1"/>
          </eventdata>
        </linkcondition>
        <linkeffect>
          <action>
            <run>
              <objref objnum="2"/>
            </run>
          </action>
        </linkeffect>
      </link>
    </items>
    <inputeventreg num="1"/>
    <scenecs xscene="800" yscene="600"/>
  </scene>
</mheg5>
```

© ISO/IEC 2001 – All rights reserved

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Annex C
(informative)

DTD validation

The DTD and the example objects defined in Annexes A and B have been verified by IBM Xeena v.1.0.3B and XP v. 0.5.

© ISO/IEC 2001 – All rights reserved
Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

ICS 35.040

Price based on 21 pages

© ISO/IEC 2001 – All rights reserved

--`,,`,,`-`-`,,`,,`,`,,`---

Copyright International Organization for Standardization
Reproduced by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale