

**GENERAL AGREEMENT ON
TARIFFS AND TRADE**

RESTRICTED

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INTEGRATED DATA BASE

IDB SYSTEM OVERVIEW

Note by the Secretariat

This paper is a revision of the sections "Project Development Organization", "Conversion Processing" and "Data Base Considerations" of "Project Structure" reproduced in document IDB/W/2/Rev.1.

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A. DATA PROCESSING ORGANIZATION

Between the reception of IDB submissions in the Secretariat and the dissemination of the information to users, various data processing operations are required to integrate the information provided. These operations are carried out in three phases:

- (1) The conversion phase: At reception, the tapes are registered at the ICC (International Computing Centre, used by international organizations in Geneva). Their contents and formats are analyzed and the various national codes are converted to IDB standard codes. Errors are corrected if possible, incorrect records are dropped, and the files are prepared for loading in the data base using a format adapted to Adabas¹
- (2) The work data base phase: Before the submissions are loaded in the "User Integrated Data Base" (UIDB) where they will be accessible to users, or copied on computer tapes or PC diskettes for dissemination, the information is stored in the "Work Integrated Data Base" (WIDB), accessible only by the Secretariat. In the WIDB, any additions, corrections or deletions of data can be carried out as required, after the conversion phase. Adjustments of the work data base files will be performed using an update system developed by the Secretariat
- (3) The user data base phase: When a submission stored in the WIDB is considered as finalized, and with the authorization of the country concerned, the WIDB files are loaded in the UIDB and made available to users.

The organization and the structure of the WIDB and of the UIDB are identical. The reason for maintaining two separate data bases is to avoid users being affected by unforeseen problems, and by the maintenance activities carried out for the WIDB by the Secretariat. In addition, such separate environments are better adapted to specific users (data managers or end-users), since differentiated access policies should be implemented.

Organization of the work within the Secretariat

The Secretariat plans to organize the work relating to the Integrated Data Base in the following manner:

Statistical officers (hereafter referred to as "data managers") will be responsible for the processing of submissions, from their initial receipt, through the conversion phase, the work data base phase and the user data base phase. Their functions include:

- verification of data for correctness and completeness
- follow-up of any errors or problems detected
- contact with delegations concerning IDB matters
- liaison with the Information Systems Section for data processing services
- liaison with Secretariat users.

The Information Systems Section will be responsible for data processing services for the IDB in liaison with the data managers. Its functions include:

- job submission at the request of the data managers
- control of processing for correctness and completeness
- data entry at the request of the data managers
- development of applications, software support and user training
- data base administration
- liaison with the delegations concerning technical matters relating to the IDB.

¹ Adabas: A Data Base Management System from Software AG company, used to develop the IDB system.

1. CONVERSION PHASE

Each file in a submission is processed through a series of specific programs. These operations are performed outside the data base and data processing is done mainly using tapes, in sequential mode.

1.1. Steps common to all files

The following processing steps are performed for each file of a submission, unless otherwise mentioned:

- Data reception** The documentation received with the tape, namely, date, provenance and volume identification number (external label), is registered.
- The tape is sent to the ICC and the following information is obtained: internal volume label, density and creation date. A utility program identifies each file recorded on the tape, and its data set name, record length and block size. If applicable, any necessary conversion is applied (e.g. introduction of standard record length, block size, label). The files are then copied onto a GATT-owned volume with standard characteristics.
- Registration** All information obtained from the data reception steps is recorded in an IDB system file, the conversion log, and the version of each file submitted is "activated" for the subsequent processing steps. The conversion log file can be queried by users to obtain information on the submissions received and progress reports on the status of their conversion.
- Data analysis** The formats of the files and their contents are analyzed. A report is produced to show the number of records, the number of tariff lines and all values recorded for each data element.
- This report is used to update the reference files containing national codes and their corresponding IDB standard codes (see "National reference files", below).
- Microfiching** The contents of each file is formatted and stored on COM². These fiches are required when a precise reference to the original submission is needed. Optionally, the output could be made available on magnetic tape. If required, a format could be designed to copy the information on PC diskettes.
- Data editing** All data elements recorded in the submissions are verified. If necessary, erroneous data can be mass-replaced with correct values for certain elements. A report identifying all errors and anomalies is produced for each file. Edit programs are executed as many times as is necessary to solve all problems identified.
- Data conversion** The data are converted from national codes to the IDB standard codes (e.g. country codes, quantity unit codes, etc.). The formats of the files resulting from data conversion are identical to the formats of the IDB standard tape output files, which will be used for data exchange. The reporter, C.U. member and partner codes are changed from five characters in the submission formats to three characters in the IDB standard formats.

² COM Computer Output Microfiche; one fiche contains 270 pages; reduction rate 1:48.

Pre-load data analysis

Before a submission is loaded in the WIDB, the contents of converted files are verified using summary reports similar to those produced in the data analysis above.

Separation of "historical" data

For the coded tariff and coded non-tariff files, information which is not in force for the year of reference is separated from the "current" information and stored in "historical" files.

Adabas formatting Files are formatted for processing by the Adabas loading utility.

Completion When a file is loaded in the WIDB, the conversion log file is updated to indicate that the conversion phase is completed.

Copies of the reports produced by the above programs are sent to the delegation which provided the information.

1.2. File-specific processing

1.2.1. Trade Statistics

(1) *Data editing :*

In addition to the controls common to all files, the partner type of relation code and the tariff treatment code are verified. If the treatment code is not provided, the type of relation code is used as a default value for the treatment code.

(2) *Data conversion :*

Where necessary, imports recorded in national currency are converted to US dollars using the exchange rate received from the reporting country or the yearly average exchange rate, as published by the IMF.

The format of the file is changed to the IDB standard format. The submission format contains two import values, namely, the c.i.f. value and the customs value (if not c.i.f.). The IDB standard format contains only one import value, the customs value (c.i.f. or any other value). An additional field is added to the standard format to record the customs value in US dollars. The duty collected is not kept in the IDB standard format.

For each statistical item, the following aggregate records are generated: a total for all countries of origin, a total for GATT members, and, where applicable, a total for the least-developed countries, a total of Customs Unions (C.U.) member countries and totals by type of relation.

(3) *Matching :*

The statistical item numbers recorded in the trade file are checked against the tariff item numbers recorded in the coded tariff file. Any discrepancies are printed.

(4) *Pre-load verification :*

Reports summarizing the trade information recorded in the converted file are produced to verify the consistency of the data with published statistics:

- total trade by IIS chapters
- total trade by country of origin and by tariff treatment

These reports are produced in national currency and in US dollars, for the agriculture and industry sectors.

1.2.2. Coded Tariff File

In addition to the controls common to all files, the following processing is specific to the coded tariff file:

(1) *Submission adjustment:*

If certain elements of the key of the coded tariff file records are miscoded, the adjustment program can mass-replace the value of the following elements with a new value:

- the validity period, the measure type, the partner code, the duty type and combinations of record type, language code and sequence number.

(2) *Editing, step 1:*

The various controls applied to the coded tariff information have to be performed within given key sequences. For this reason, the editing is done in three steps.

In the first editing step, incorrect data are replaced by the following default values unless correction processing is specified:

- the duty rate in percentage is changed to "999.999" (not available)
- the nature code is changed to blank (ad valorem duty)
- the estimation code is changed to blank (not applicable)
- the ad valorem equivalent (AVE) calculation method is changed to "9" (other method)
- the averaging method is changed to blank (not applicable)
- the binding code is changed to blank (bound at prevailing duty rate)
- the partial binding coverage is changed to blank (not applicable)
- the limitation status code is changed to blank (not applicable)
- the partial duty coverage code is changed to blank (not applicable).

In addition, the following verifications are made:

-for any duty type:

- if record type "1" is not recorded, corresponding record types "2", "3" and "4" are dropped
- if the format of record type "2" is invalid, the record is dropped
- for record types "3" and "4", blank text lines are dropped
- for m.f.n. duties (duty types "01"- "09"), if a record type "2" (normalized coding) is recorded with "bilateral" duties (AVE's for individual partners, i.e., partner code is informed), the record is dropped.

If a default value is applied, a warning message is printed. If a record is dropped, an error message is printed.

(3) *Editing, step 2:*

The second editing step checks the consistency of information recorded among duty types. Only tariff lines having the validity period in force during the reference year, are considered. The following controls are applied to m.f.n duty types ("01"- "09"). No controls are made for other duty types ("10"- "99").

- For each "global" duty (duty applies to all partners, i.e., partner code is blank) applicable to the tariff line:

-- There must not be a mixture of blank and informed periods of validity; in this case, the records having the validity period informed are dropped. For tariff lines having the tariff suffix blank or "00", the period of validity should cover the entire reference year. For all tariff lines, there should be no overlapping date ranges.

-- For tariff lines having the tariff suffix blank or "00":

--- Duty types "01" or "02" (bound or statutory duties) must be recorded. If this is not the case, all records for the tariff line are dropped.

--- If the duty type "01" is recorded, it should be bound and all other m.f.n. duties should also be bound.

--- If the duty type "01" is not recorded, all m.f.n. duties recorded should be unbound.

- If "bilateral" duties are recorded (AVE's for individual partners, i.e., partner code is not blank):

-- A "global" duty must be recorded for the corresponding duty type and validity period. If this is not the case, the "bilateral" records are dropped.

-- For each "bilateral" duty, of all the codes recorded in record type "1", only the duty rate, the estimation code and the AVE calculation method can differ from the codes recorded in the record type "1" of the corresponding "global" duty. If this is not the case, "global" duty codes are applied as default values.

According to the error detected, the corresponding records are modified or dropped and an warning or error message is printed.

(4) *Editing, step 3:*

The third editing step is performed only if the submission contains tariff lines having the tariff suffix informed. The following controls are applied for each tariff item number (pos. 1-21 of the tariff line):

- For a given tariff item number, there should not be a mixture of blank and informed tariff suffixes; otherwise the records with the tariff suffix informed are dropped.

- Tariff items having the suffix informed ("01"- "99"), must have a corresponding tariff item with suffix "00"; otherwise the records with the suffix informed are dropped.

For each record dropped, an error message is printed.

1.2.3. Textual Tariff File

In addition to the controls common to all files, the following processing is specific to the textual tariff file:

(1) *Format checking:*

The formats of the variable length textual tariff records are checked. The actual length of the records should correspond to the length implied by the "number of occurrences" field. For discrepancies, the record length and/or the number of occurrences are(is) adjusted, if possible; otherwise the record is dropped.

(2) *Editing:*

The tariff suffix is checked as for the coded tariff file (see "Editing - step 3", above).

Records having blank text lines are dropped.

For the legal product description (element "02"), the level should be "00" for tariff lines and should be equal to the length of the tariff line number for tariff headings. If incorrect, the level is adjusted.

(3) *Formatting :*

The records are formatted in order to have fixed-length records, which better suit the requirements of display and reporting. The elements of the file are formatted in the IDB standard format as follows:

Submission format				IDB standard format			
Element	Sub-element (Lang- Seq. uage no.)		Occur- ences	Element	Sub- element	Lang- uage	Seq. no.
length: (2)	(1)	(2)	(2)	(2)	(2)	(1)	(2)
01				01			
02	L	XX		02		L	XX
03			VL	03			NN
04			NN	04			NN
05			NN	05			NN
06			NN	06			NN
07		XX	NN	07	XX		NN
07		XX	VL	10	XX		NN
08			VL	08			NN
09	L	XX		09		L	XX
11		XX		not applicable			

The number of occurrences (NN) and, with the exception of element "07", the sequence number (XX) in the submission format, are transferred to the sequence number in the IDB standard format. Variable length text records (VL) are formatted to fixed length records, with the sequence number of the IDB standard format indicating the order of the records. For element "07", the sequence number of the submission format is transferred to the sub-element of the IDB standard format and the variable length text is transferred to element "10".

The four-character footnote number recorded in element "11" is appended to the element(s) to which the footnote refers, after the sequence number. The element "11" record, which is no longer necessary, is deleted.

(4) *Matching :*

The tariff line numbers used in the textual tariff file are checked against the coded tariff file nomenclature. All discrepancies are printed.

1.2.4. *Quantitative Restrictions files*

In addition to the controls common to all files, the following processing is specific to the QR files:

(1) *Submission adjustment :*

If certain elements of the key of the coded QR records are miscoded, the adjustment program can mass-replace the value of the following elements with a new value:

- validity period, measure type and combinations of record type, language code and sequence number.

(2) *Editing :*

For record types "4" and "5", records with blank text lines are dropped.

A warning message is printed if there is a record type "2", "3", "4" or "5", having no corresponding record type "1".

The coherence of validity periods recorded for a measure is verified: there should be no overlapping date ranges in the validity periods recorded.

(3) *Formatting :*

The records of the textual non-tariff file are changed to the IDB standard format, as described in the formatting of the textual tariff file (elements "02" and "09"), above.

(4) *Matching :*

The tariff item numbers used in the coded QR file are checked against the nomenclature of the coded tariff file.

The tariff line numbers used in the textual QR file are checked against the nomenclature of the coded QR file.

All discrepancies are printed.

1.3. Types of reports produced in the conversion phase

Each program in the conversion phase produces three reports: a user report, a processing report and a control report. Each page of each report contains a standard header and a body part which varies according to the report produced.

(1) The **standard header** contains the following information:

- The first line shows the program name, the report title, the date and time of the processing run and the page number.
- The second line contains the reporting country abbreviation and, for the file concerned, the reference year, the version number and the period covered by the data.

(2) The **user report** produces information related to the parameters and options in force at processing execution time such as:

- If certain error messages should not be printed in the processing report, the error codes which should be suppressed are listed together with the corresponding error messages.
- If the mass-correction feature is used for the processing run, each data element affected by the correction feature is printed along with the erroneous value and the corresponding correct value.

(3) The **processing report** shows the operations performed by the program concerned. Reports produced for the various files are similar in their presentation.

(4) The **control report** summarizes the processing carried out and gives statistical information on the contents of the files such as:

- the number of records (input, output, dropped, duplicates)
- the number of tariff lines: total, in force, with tariff suffix blank, "00" or "01"- "99"
- where error or warning messages are printed, the number of messages by message code and whether or not the printing of the message was suppressed
- any other relevant information.

1.4. Conversion log file

All IDB conversion programs store the information printed on the control reports in the conversion log file. The layout of the conversion log file is as follows:

Year/Reporter	Reference year of the submission and reporting country concerned
Domain	Code identifying the domain of information (trade, tariff, non-tariff)
File	Indicates the submission file to which the log information refers
Version	Indicates the version number of the file
Status	Indicates whether the version of the file is being converted (code "A" for "active"), or if the conversion is completed (code "C")
Program name	Abbreviated name of the program storing the information
Date/Time	Date and time of the execution of the program
Element	Code identifying the type of information recorded
Record number	Allows for storing information for the same element on several records
Data part	Statistics shown in the control reports

Conversion Log maintenance system

Update processor	This processor allows the data managers to update the conversion log file.
Report processor	The report processor produces log information reports in batch mode. These reports will be regularly distributed to users.
Query processor	<p>The conversion log file is available on-line for users. The query processor produces screen output based on variable combinations of hierarchical search criteria: year, reporter, file, version and program.</p> <p>The content of the log file is displayed according to different levels of presentations, from general information to details. From each level of the request, the user can obtain more specific information (see examples on next page).</p>

On-Line Query of the Conversion Log File (examples)

USER'S REQUEST		SCREEN OUTPUT				
1. YEAR/REP		File	Version	Status	Date	Time
	S	TM	1	C	89-07-10	12:47
		TM	2	A	89-08-12	14:57
		TC	1	C	89-08-13	18:32
		TC	2	A	89-08-15	09:25
		NC	1	A	89-08-16	10:15
2. YEAR/REP/FILE		Version	Status	Date	Time	
		1	C	89-07-10	12:47	
	S	2	A	89-08-12	14:57	
3. YEAR/REP/FILE/VERSION		Program	Stepname	Date	Time	
		PITM00A	Trade Imports mapping	89-07-10	12:47	
		PITM00B	Submission report	89-08-12	09:10	
	S	PITM00C	Edit program	89-08-13	09:20	
		PITM00E	Conversion	89-08-14	14:57	
4. YEAR/REP/FILE/VERSION PROGRAM		Log element	Description	Count/ value	Mess. suppr.	
		001	Normal completion			
		050	Input records	85761		
		800	Output records	85000		
		850	Dropped records	761		
		100	Chapters	92		
		102	Partners	214		
		103	Total nat. currency	234,455,567		
		113	Total US \$	98,344,789		
		E461	Invalid partner codes	761	N	
		W465	Non-numeric quantity	2546	Y	

Note: The user can enter the query processor via options 1 to 4 (options 1 and 2 are mutually exclusive). It is possible to get more detailed information on any item by selecting (with an "S"), any line displayed as shown above in options 1, 2 and 3.

1.5. Global reference files

The global reference files contain information common to all reporters, and are used to validate the information recorded in the various files of a submission. These files, which contain texts and names associated to the IDB standard codes, are also used to print abbreviations or names of codes in reports.

Country codes file

This file contains information on geographical definitions used throughout the system.

Country code This three-digit code is used for all geographical entities such as reporting country, partner country, country maintaining quantitative restrictions and country affected by measures. The coding system follows ISO recommendations. This code is also used to identify trade aggregate totals by type of relation (the aggregate codes have been added by the Secretariat).

GATT member code.

This code, identifying the GATT contracting parties, is used for the aggregation of trade from GATT members.

Country abbreviations.

Names are recorded in three abbreviations (two characters, three characters and eight characters).

Country name. ISO country name (twenty characters)

Language code The language code (English, French, Spanish) identifies the GATT official language, which should be used to print/display reports and documentation, for the country concerned.

Initial Negotiating Rights file

This file contains the list of codes used to identify countries holding Initial Negotiating Rights (INR's).

INR code Used in the textual tariff information file to indicate partner countries holding INR's. Refer to document IDB/W/4/Add.1 for a list of code values.

Partner code ISO partner code associated to the INR code; used to link INR holders to import statistics and tariffs.

INR country name INR holder name.

Customs Unions member countries definition

This file contains, for each period of reference, the list of partner codes of members of a Customs Union (C.U.).

C.U. code GATT country code assigned to one C.U.

Period Start year and end year of the period valid for the C.U. definition

C.U. member list list of C.U. members for the period; ISO country codes stored in ascending order.

Quantity unit file

This file contains a list of all quantity unit codes used in the IDB.

Unit code	The three-digit quantity unit code. Refer to IDB/W/4/Add.1 for a list of code values.
Unit abbreviation	Three-letter quantity unit abbreviation.
Unit symbol	Thirteen-character short unit name.
Unit name	Forty-character quantity unit name.

Measure codes file

This file contains a definition of non-tariff measures.

Type of measure	Two-digit code indicating the nature of the restriction (QR's applying to imports or QR's applying to exports)
Measure code	This three-digit code is used to define non-tariff measures.
Measure symbol	The eight-character symbol which is associated with the measure code (e.g. BQ, AL, STR).
Measure designation	Seventy-character description of the measure.

GATT legal instruments file

This file contains a list of GATT Legal Instruments recorded in the textual tariff files.

Instrument symbol Refer to document IDB/W/4/Add.1 for a list of symbols.

GATT documents file

This file contains a list of document numbers recorded in the coded QR file. See IDB W 4 Add.1 for the list of document numbers.

Document number GATT numeric code (e.g. 85ID0159)

GATT document symbol
As printed in GATT documentation (e.g. NTM W 12)

GATT articles file

This file contains a list of GATT articles recorded in the coded QR files.

Article code GATT alphanumeric code. Refer to IDB/W/4 Add.1 for a list of code values.

GATT Article symbol
As they appear in GATT documentation.

Harmonized System nomenclature file

This file contains descriptions of HS headings at two-digit, four-digit, five-digit and six-digit levels.

HS number HS number at the various levels.

Language code Identifies the language in which the description is recorded.

Record number	Used to store several lines of text for the same HS number (one line for short descriptions, up to four lines for abbreviated descriptions and up to ninety-nine lines for legal descriptions).
HS descriptions	Text attached to each HS number (seventy characters).

Codebook file

This file is used for the validation of codes recorded in the submissions. It contains the names of codes recorded in the various files and their corresponding possible values.

Code name	Field name assigned to the various codes such as "BINDING", "NATURE", etc.. The code name is used to access the codebook file.
Occurrences	Number of possible values for a code.
Code length	Number of characters necessary to represent a code.
Code values	List of all possible correct values for a given code.

1.6. National reference files

The national reference files contain data pertaining to each reporting country and to each reference year. They are used by the conversion programs to validate national data and to convert them to the IDB standard codes.

Reporting country file

This file contains information pertaining to each country submitting data for the IDB.

Year	Reference year of the submission
Reporter code	Six-character code identifying the country or C.U. submitting the data; <i>Country (or C.U.) code</i> Three-digit ISO code. <i>C.U. member</i> Three-digit ISO code identifying, where applicable, the member of a C.U. to which the information pertains
Submission status	Series of codes indicating the files which have been submitted by the reporter
Tariff treatments	The tariff treatment codes recorded in the trade file submitted
HS indicator	Indicates whether or not the submission is based on the HS nomenclature
Exchange rate	For the year of reference, the exchange rate used to convert the currency of the trade file to U.S. dollars
Imports currency	Currency unit used in the trade file
Duties currency	Currency unit used in the normalized coding of specific duties
Currency adjustment factor	The ratio of the imports currency to the duties currency used in the normalized coding of specific duties, in the coded tariff file
Supplementary quantity flag	Indicates whether or not supplementary quantities are recorded in the trade file

Other information

<i>System of trade</i>	Special, general, etc.
<i>Valuation basis</i>	C.i.f., f.o.b, etc.
<i>Duty assessment</i>	Net weight, gross weight, etc.
<i>Type of year</i>	Fiscal or calendar

National country codes file

This file contains the national country codes used in the submissions for recording partner countries in the various files, and their corresponding IDB standard codes.

Year	Reference year of the submission
Reporter code	Reporting country ISO code
National country code	Code used in the national submission for recording partner countries
Partner code	Three-digit ISO code
Partner type of relation	Type of relation code attached to the partner country
LDC indicator	Code attached, where applicable, to least-developed countries entitled to differentiated preferential treatment

National Initial Negotiating Rights file

This file contains the list of codes used in the textual tariff file to identify contracting parties holding Initial Negotiating Rights (INR's)

Year	Reference year of the submission
Reporter code	Reporting country ISO code
National INR code	Code used in the textual tariff file submission
INR code	IDB standard code. Refer to document IDB/W/4/Add.1 for a list of code values.

National quantity unit file

This file contains a list of national quantity unit codes used in the various files and their corresponding IDB standard codes.

Year	Reference year of the submission
Reporting country	Reporting country ISO code
National quantity unit	Code used in the national submission for recording quantity units
IDB quantity unit	IDB standard quantity unit code

National measure codes file

This file contains a list of national QR codes (type of measure and measure code) used in the coded QR file and the corresponding IDB standard codes.

Year	Reference year of the submission
Reporter code	Reporting country ISO code
National measure code	Measure type and measure code used in the national submission for recording QR's
Type of measure	Two-digit IDB standard code indicating the direction and nature of the restriction (QR's applying to imports or QR's applying to exports)
Measure code	Three-digit IDB standard QR code

Country notes file

This file contains textual information on matters related to submissions for the IDB: detailed explanations concerning any problems encountered in the conversion phase and explanations related to the processing of the files. It is organized by country, reference year and file. Information from this file will be printed with analytical reports and may be accessed on-line.

1.7. System development and production support files

There are two series of support files. They contain respectively, information used by programmers for system development and information used by the data managers for processing submissions.

System development support files

Domain definition	All IDB information is organized by domains and sub-domains. There are four domains, namely, trade, tariff, non-tariff and references. Within each domain, sub-domains distinguish the type of information recorded (e.g. coded or textual sub-domains for the tariff domain). The domain definition file contains codes, identifying the domains and their associated sub-domains and files. These codes are used in the IDB application programs.
Message file	This file contains all message codes and descriptions which are printed by the conversion programs. The message file is organized by sub-domain, message code and message type ("W" for warning message, "E" for error message and "I" for information message).
Program file	This file contains all IDB abbreviated program names and their corresponding full names.
Log files element definition	This file contains all element codes and descriptions stored in the various log files. It is organized by type of log file (e.g. conversion log file, user log file), sub-domain and element code. It is used by IDB programs for reporting and displaying the log file.

Production support files

Data correction file This file is used for the mass-correction feature available in some of the conversion programs. The file contains the following data elements:

Year/Reporter/Version	Reference year, reporting country and version number of the file to be corrected.
Program name	Abbreviated name of the program which will apply the correction
Field name	Abbreviated name of the field to be corrected.
Invalid value	Value to be corrected
Correct value	Value replacing the invalid value

Message suppression This file contains message codes which should not be printed when a checking process is not satisfied. This feature reduces the report volume in cases where systematic errors have been detected in the submissions.

Year/Reporter/Version	Reference year, reporting country and version number of the file concerned.
Program name	Abbreviated name of the program which will suppress the printing of the message
Message code	Message code which should not be printed

2. WORK DATA BASE PHASE

After the submissions have been processed in the conversion phase, they are stored in the WIDB for possible further processing and for final checking, before their transfer to the UIDB. Updating and transfer of information will be carried out *with the prior authorization of the delegation concerned.*

The work data base phase has the following objectives:

- loading the converted submissions into the WIDB
- correction of errors and anomalies identified in the conversion phase, and the application of requested adjustments to the information, by means of the WIDB update program
- final verification of the submissions, by means of the final checking program
- transfer of the information from the WIDB to the UIDB.

2.1. Loading procedure

This procedure stores the information in the WIDB and performs functions required by the Adabas software which manages the WIDB (data compression, creation of inverted list files necessary for direct access to the data, etc..)

The following processing steps are performed:

- (1) Files are loaded one at a time, using Adabas utility programs.
- (2) If there is a previous version of the data stored in the WIDB for the reporter and file concerned, it will first be unloaded to produce tape copies for backup.
- (3) Since the WIDB contains information for one year only, for a given file and reporter, the data for the previous version are then deleted.
- (4) This procedure is repeated for each file received in the submission until the entire submission is loaded. Not all WIDB files need to be loaded together. For instance, should a delegation make available a new version of its import statistics, the new version could be converted and replace the existing import statistics file in the WIDB. Other WIDB files would not be affected.

2.2. WIDB update system

The Secretariat has developed an application system to provide facilities to update information in the WIDB. Its primary function is to correct problems identified in the submissions during the conversion phase, thus avoiding the request of an entire new submission from the delegation concerned. At the request of delegations, this update system could also be used to create, delete or update *small volumes* of data. It is therefore important that delegations be aware of the facilities provided.

After all updating is completed, a final checking program verifies the consistency of information recorded across the files, before the information is transferred to the UIDB.

The update system has been written in Adabas/Natural programming language as were the programs for the conversion phase. The system was designed to operate in batch mode to facilitate the organization of work in the Secretariat.

The update system is a 'transaction-driven' system, i.e., required update operations are specified by means of coded transactions. These transactions are the input to the update system and are stored in files by "batches". The batch number appears on reports produced by the update program.

All changes made to the WIDB files will be notified to the delegation concerned by means of update reports. The reports produced by the final checking program will also be forwarded to the delegation concerned. For these reasons, certain concepts used in the update system are explained in detail in the following sections of this document.

2.2.1 Update transactions

Transactions have been designed to carry out specific operations on the WIDB files. Each transaction operates on a specified file, year, reporter and tariff line number. Further identification of the WIDB key elements, for the record(s) to be updated, depends on the type of transaction and the WIDB file to be updated.

Transactions have been defined to create, update or delete any record in the WIDB with the exception of the import statistics file, for which only deletes and tariff number changes are possible. If necessary, transactions to create and update trade will be implemented at a later stage.

In addition, transactions were created to handle nomenclature changes, as well as deletes or changes for sets of related records (referred to hereafter as "generic delete" and "generic change" transactions).

Descriptions of the transactions and their functions are as follows:

(1) Transactions applied to one tariff line in all files

Tariff item number delete

This transaction deletes all records for a given tariff item number (positions 1-21 of the tariff line number) in all the WIDB files.

Tariff item number change

This transaction changes all records for a given tariff item number (positions 1-21 of the tariff line number) to a new tariff item number in all the WIDB files.

(2) Transactions applied to one tariff line in a specific file

The following transactions can be applied to each of the WIDB files, except, unless otherwise stated, the import statistics file.

Tariff line number delete

This transaction deletes all records for a given tariff line number in a given file. It can be applied to the import statistics file. If it is applied to the coded tariff or coded non-tariff file, the corresponding textual file records for the tariff line number are automatically deleted.

Tariff line number change

This transaction changes all records for a given tariff line number to a new tariff line number in a given file. It can be applied to the import statistics file. If it is applied to the coded tariff or coded non-tariff file, the corresponding textual file records for the given tariff line number are automatically changed.

Create

This transaction is used to create a new record.

Update

This transaction updates selected data fields of an existing record.

Delete

This transaction deletes one record or a set of related records.

(3) Transactions specific to the coded tariff file

Validity period delete

This transaction deletes all records for a given tariff line number, partner and duty type, having the validity period equal to a specified value.

Record type delete

This transaction deletes all records for a given tariff line number, partner, duty type and validity period, having the record type equal to a specified value.

Language delete

This transaction deletes all records for a given tariff line number, partner, duty type, validity period and record type, having the language code equal to a specified value.

Validity period change

This transaction changes all records for a given tariff line number, partner and duty type, having the validity period equal to a specified value, to a new specified value.

Tariff line number create

This transaction creates the first record(s) for a tariff line number which does not exist in the coded tariff file.

(4) Transactions specific to the textual tariff file

Element delete

This transaction deletes all records for a given tariff line number, having the element number equal to a specified value.

Language delete

This transaction deletes all records for a given tariff line number and element, having the language code equal to a specified value.

Sub-element delete

This transaction deletes all records for a given tariff line number and element, having the sub-element equal to a specified value.

(5) Generic transactions

The following examples show the generic transactions which can be applied to the coded and textual tariff files for a given year, reporter and tariff line number.

CODED TARIFF FILE GENERIC TRANSACTIONS						
DUTY TYPE	PART-NER	VALIDITY PERIOD	RECORD TYPE	LANG-UAGE	SEQUENCE NUMBER	TRANSACTION TYPE
X	Y	Z	all	all	all	delete all Z for X and Y
X	Y	Z	A	all	all	delete all A for X, Y and Z
X	Y	Z	A	B	all	delete all B for X,Y,Z and A
X	Y	Z	all	all	all	change Z to another value

- (a) In the above example, the first line illustrates the generic deletion of one validity period for a specified tariff line number, duty type and partner. All records having the validity period equal to "Z", for duty type "X" and partner "Y", will be deleted.
- (b) The second line illustrates the generic deletion of one record type for a specified tariff line number, duty type, partner and validity period. All records having the record type equal to "A", for duty type "X", partner "Y" and validity period "Z", will be deleted.
- (c) The third line illustrates the generic deletion of one language for a specified tariff line number, duty type, partner, validity period and record type. All records having the language code equal to "B", for duty type "X", partner "Y", validity period "Z" and record type "A", will be deleted.

- (d) The fourth line illustrates the generic change of one validity period for a specified tariff line number, duty type and partner to a specified new value. All records having the validity period equal to "Z", for duty type "X" and partner "Y", will be changed to the specified new value.

Note that in the above examples, if partner Y is "global" (the duty applies to all trading partners), all corresponding "bilateral" records (partner informed) will be deleted or changed as well.

TEXTUAL TARIFF FILE GENERIC TRANSACTIONS				
ELEMENT	SUB-ELEMENT	LANGUAGE	SEQUENCE	TRANSACTION TYPE
X	all	all	all	delete all X
X	n.a.	Y	all	delete all Y for X (X=02,09)
X	Z	n.a.	all	delete all Z for X (X=07,10)

n.a. = not applicable

- (a) In the above example, the first line illustrates the generic deletion of one element number for a specified tariff line number. All records having the element number equal to "X" will be deleted.
- (b) The second line illustrates the generic deletion of one language for a specified tariff line number and element number. All records having the language code equal to "Y" for element "X" will be deleted.
- (c) The third line illustrates the generic deletion of one sub-element number for a specified tariff line number and element number. All records having the sub-element number equal to "Z" for element "X" will be deleted.
- (6) **Transactions specific to the non-tariff files**

These transactions are similar to those of the tariff files except that the C.U. member and, for the coded non-tariff file, the measure type are also specified.

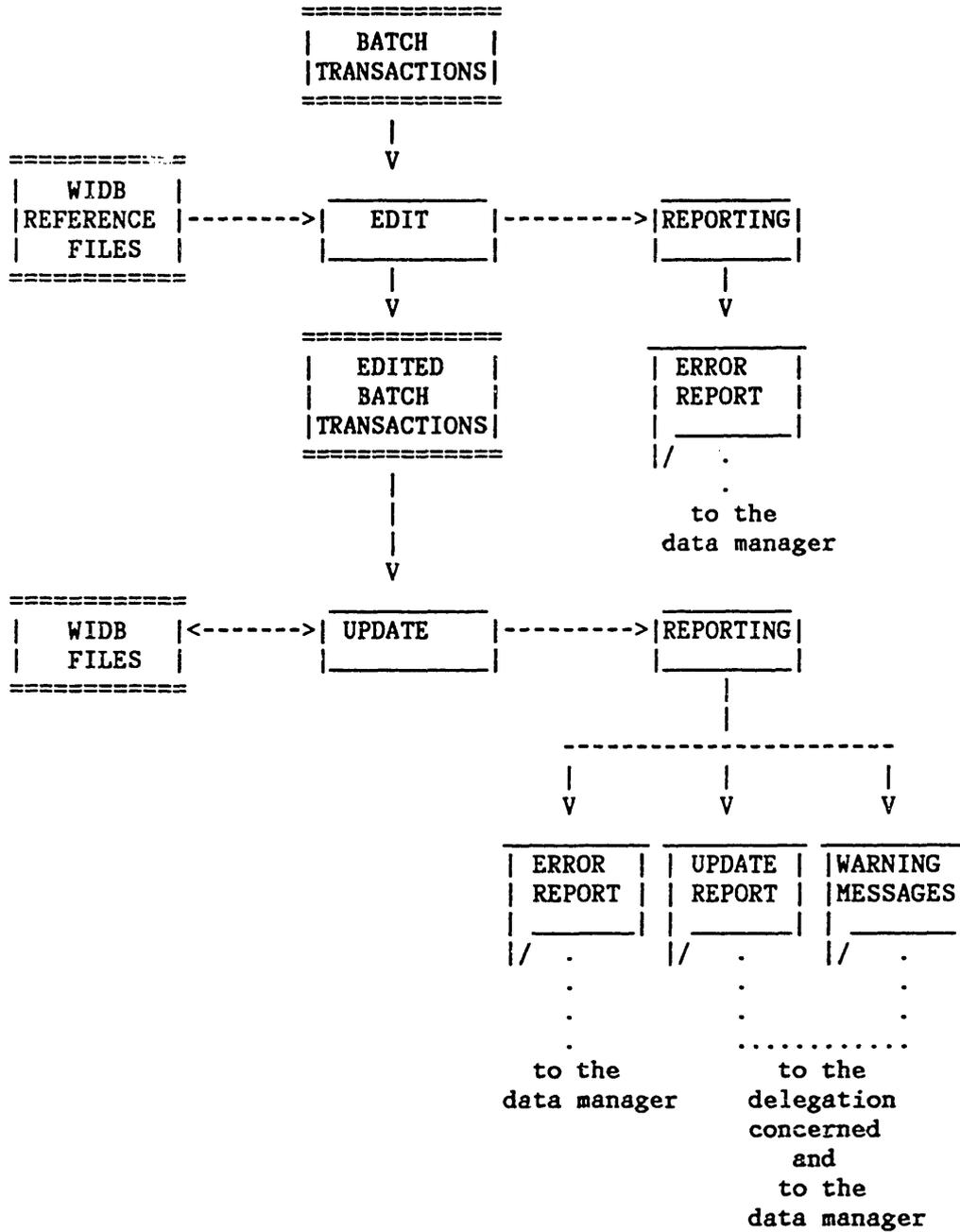
(7) Transaction codes

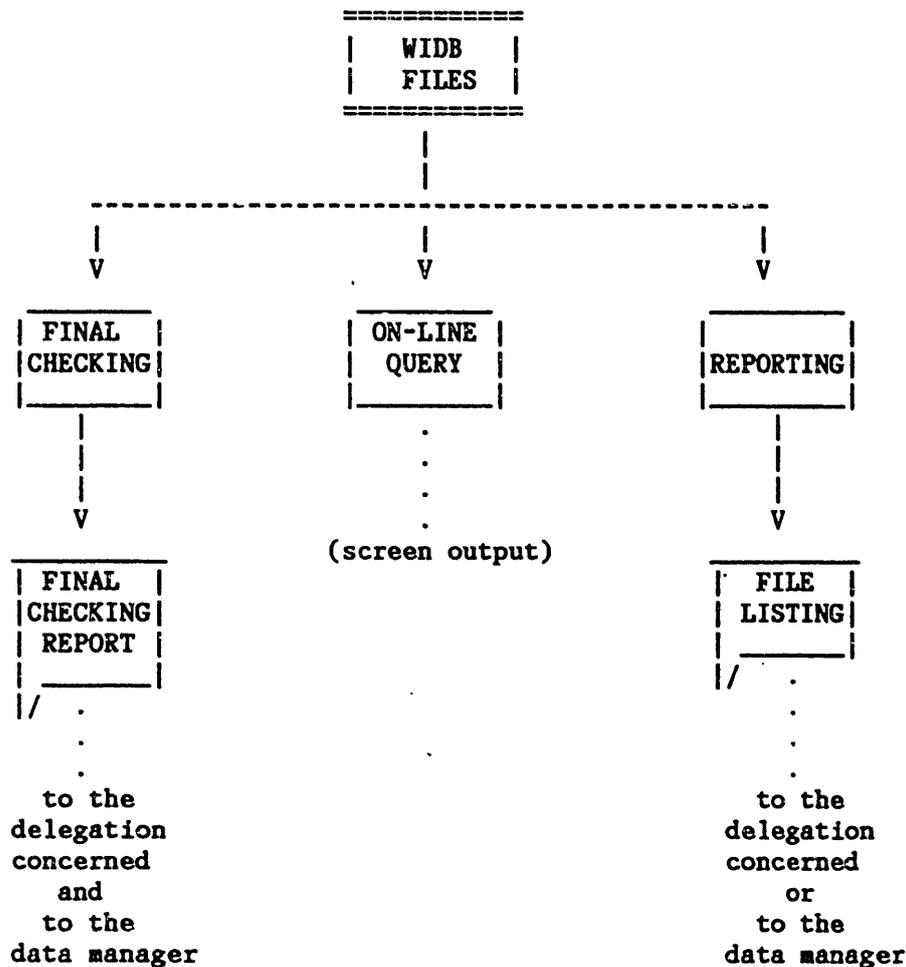
Each type of transaction has been assigned a code. These codes and a short description will appear on the reports produced by the update program. Each WIDB file has also been assigned a code. The association of these two codes enables the update program to determine the type of update operation to be executed. The possible update operations are as follows:

WIDB FILE CODE	WIDB FILE NAME	TRANSACTION CODE	TRANSACTION DESCRIPTION
00	all files	10	tariff item delete
00	all files	20	tariff item change
10	coded tariff	10	tariff line delete
10	coded tariff	15	generic delete
10	coded tariff	20	tariff line change
10	coded tariff	25	generic change
10	coded tariff	30	tariff line create
10	coded tariff	35	create record
10	coded tariff	40	update record
20	footnote text	15	delete
20	footnote text	35	create record
20	footnote text	40	update record
25	textual tariff	10	tariff line delete
25	textual tariff	15	generic delete
25	textual tariff	20	tariff line change
25	textual tariff	35	create record
25	textual tariff	40	update record
30	import statistics	10	tariff item delete
30	import statistics	20	tariff item change
50	coded non-tariff	10	tariff line delete
50	coded non-tariff	15	generic delete
50	coded non-tariff	20	tariff line change
50	coded non-tariff	25	generic change
50	coded non-tariff	35	create record
50	coded non-tariff	40	update record
55	textual non-tariff	10	tariff line delete
55	textual non-tariff	15	generic delete
55	textual non-tariff	20	tariff line change
55	textual non-tariff	35	create record
55	textual non-tariff	40	update record

2.2.2 Update system programs

These diagrams illustrate the system design:





The functions of these programs are as follows:

Edit

- (1) Transactions are checked for proper formats and their contents are verified using the WIDB reference files.
- (2) An error report is produced showing all rejected transactions.

Update

- (1) All transactions for all WIDB files can be processed together.
- (2) The checking applied to the various data elements is similar to the checking applied in the conversion programs.
- (3) For certain files, additional checking is performed after all transactions have been applied for a given tariff line number. Warning messages are printed for any anomalies detected.
- (4) Three reports are produced: an error report showing all rejected transactions; a report showing all warning messages; an update report showing the results of all transactions which have been applied.
- (5) These reports are ordered by year, reporter, batch number, tariff line and the rest of the key (different for the various files). Separate listings are produced for each WIDB file.

On-line queries and reports

- (1) An on-line query system will be implemented in which it will be possible to query any WIDB file at the level of tariff line number for a given reporter.
- (2) A reporting system will be set up to provide listings of the contents of the WIDB files. It will be possible to produce listings for a given reporter and, optionally, for selected ranges of tariff line numbers. Separate listings will be produced for each WIDB file.

Final checking program

A final checking program will be created to verify the consistency of the information recorded in all the WIDB files, before their transfer to the UIDB.

These verifications were done in the conversion phase, but were not introduced in the WIDB update program because of program efficiency considerations. The checking of the tariff suffix and of the validity period, described below, was done in neither the conversion phase nor the WIDB update program for the same reason.

The checking is based on the information recorded in the coded tariff file. It will be possible to specify the checking to be done, based on a set of parameters. Thus, if some files or types of information are not available, the checking for these files or types of information will be bypassed. The information to be checked can be specified at the level of year, reporter, file, and optionally, by chapters, HS four-digit and HS six-digit levels.

The following information will be verified:

- (1) All tariff item numbers (positions 1-21 of the tariff line number) recorded in the import statistics file and in the coded non-tariff file should have a corresponding tariff item number recorded for duty type "01" (GATT bound duty) or duty type "02" (statutory duty) in the coded tariff file.
- (2) All tariff line numbers recorded in the textual tariff file should have a corresponding tariff line number recorded for duty type "01" or duty type "02" in the coded tariff file.
- (3) All tariff line numbers recorded in the coded tariff file should have a corresponding product description recorded in the textual tariff file.
- (4) All tariff line numbers recorded in the coded non-tariff file, having the non-tariff suffix informed, should have a corresponding product description recorded in the textual non-tariff file.
- (5) All tariff line numbers recorded in the textual non-tariff file should have a corresponding tariff line number recorded in the coded non-tariff file.
- (6) For a given tariff line number, if duty type "01" is recorded in the coded tariff file (i.e. the item is bound), element "04" should be recorded in the textual tariff file. If duty type "01" is not recorded in the coded tariff file (i.e. item is unbound), only elements "01", "02" or "09" should be recorded in the textual tariff file, for the tariff line number.
- (7) Some additional checking is performed on the coded tariff file:

Tariff suffix For tariff line numbers having the tariff suffix informed, there should be a principal item (tariff suffix "00") and at least two sub-items (tariff suffix "01"- "99") present for each duty type/partner combination (but not necessarily for the same validity period). If the averaging method is "S" (simple average), the rate recorded under the principal item should be the actual average of all corresponding rates recorded under the sub-items.

Validity period For preferential duty types, the validity periods recorded for a duty type/partner combination should have no overlapping date ranges. For m.f.n. duties, this checking is done in the conversion phase and in the WIDB update program.

3. USER DATA BASE PHASE

After the WIDB files have been finalized, and *with the prior authorization of the delegation concerned*, they are transferred to the UIDB. The UIDB is accessible to users in "read-only" mode (i.e. no update operations are possible). In addition to the files containing the submissions information, the UIDB contains system commands to run UIDB application programs. These system commands allow for on-line queries and the submission of jobs to produce reports in batch.

3.1. Loading procedure

As for the WIDB files, the information stored in the UIDB is managed by Adabas software. A submission can be transferred from the WIDB only if the coded tariff file is available, since most UIDB application programs are designed to operate from this file. The following steps are performed for the files of a submission:

- (1) Files are loaded one at a time, using Adabas utility programs.
- (2) If there is a previous version of the data stored in the UIDB for the reporter, file and reference year concerned, it will first be unloaded to produce tape copies for backup.
- (3) If the file loaded is a new version of the data for the same reference year, the data for the previous version are deleted.
- (4) The loading procedure is repeated for each file in the WIDB until the entire submission is loaded. Not all UIDB files need to be loaded together. For instance, should a delegation make available a new version of its import statistics, the new version could be converted and replace the existing import statistics file in the UIDB. Other UIDB files would not be affected.

Other operations are required to complete the transfer of information from the WIDB to the UIDB:

- (1) The UIDB contains a system file, similar to the conversion log file, called the user log file. When a file is loaded in the UIDB, the user log file is updated to indicate that the new version of the the UIDB file is "activated" for the reporter and reference year concerned.
- (2) Some of the reference files used to convert the submission are required by the UIDB application programs. Depending on the files transferred, relevant reference files are transferred to the UIDB.
- (3) Partner aggregation tables defining the geographical coverage of partner aggregate codes recorded in the coded tariff and non-tariff files are loaded at the same time as the reference files.

If any further updating is performed in the WIDB for a given file, upon completion, a new loading procedure is executed to replace the current version of the file in the UIDB.

3.2. Files in the UIDB

For each sub-domain of information, data for all reporting countries (and all years) are stored in a single data base file. The formats of the data base files differ from the formats used in the submissions. The formatting of the files in the IDB standard formats is described above in the conversion phase.

The following table illustrates the organization of the UIDB and the access sequences:

D O M A I N S					
TRADE IMPORTS	TARIFF			NON-TARIFF	
	CODED	TEXTUAL	FOOTNOTE	CODED	TEXTUAL
year	year	year	year	year	year
reporter	reporter	reporter	reporter	reporter	reporter
direction	tariff line	tariff line	fnote no.	tariff line	tariff line
tariff item	measure type	element	language	C.U. member	C.U. member
partner	duty type	sub-element	sequence no.	measure type	element
treatment	partner	language		measure code	sub-element
relation	validity	sequence no.		country aff.	language
	record no.			validity	sequence no.
				record no.	

Reference files and log files

The UIDB reference files and the UIDB log file will be stored in the formats indicated above in the description of the conversion phase.

3.3. UIDB application systems

The following applications will be available to produce reports and to retrieve data from the UIDB:

A retrieval system:

This system will allow UIDB on-line users to retrieve data base information at the tariff line level and possibly, at the HS six-digit heading level. The output could be displayed on screen or printed at the ICC or at the user's location, if the user has compatible equipment available.

A report system:

This system will produce reports for:

- large volumes of information, at tariff line level
- aggregated data, according to the various levels of the HS classification.
- other types of summary reports, as outlined in document IDB/W/5.

Depending on the size and complexity of the report requested, the output could be displayed on-line, copied on tapes or PC diskettes, or printed at the ICC or at the user's installation.

A dissemination system:

The UIDB information could be disseminated to users on various media and in various formats, as follows:

(1) Sequential files

UIDB information could be unloaded on sequential files according to the IDB standard formats used in the data base loading procedure. The unloading procedure could create copies of individual files for a given reporter and reference year. In addition, standard formats could be designed for unloading the information on PC diskettes.

Given the large volume of information which could be unloaded, a selection program will be developed to extract information according to a series of selection criteria, such as:

- year, reporting country and sub-domain
- ranges of tariff lines or ranges of two-digit, four-digit or six-digit HS headings
- for trade data: total trade or trade by aggregates, principal suppliers, bilateral trade with thresholds on value, rank, share, etc.
- for tariff data: duty types, "global" or "bilateral" duties, duties by nature, binding status, etc., product descriptions, INR'S, instruments, etc.
- for QR data: selection criteria similar to those used for the tariff data.

(2) Print files

Output generated by the retrieval and report processors could be copied on sequential "print-like" files.

(3) Adabas files

For countries using Adabas software, the Secretariat could unload the IDB data in Adabas file formats. The corresponding data definition modules as well as copies of the UIDB reference files would be communicated.

(4) PC application software

If requested, the Secretariat could develop PC application software which could be made available with the data files. Such application software would be designed for IBM (or IBM-compatible) micro-computers. The operating system, the programming language, the file manager or the data base management system which would be used by the Secretariat should be discussed with interested users. Other points for discussions include: the application portability, the PC minimal hardware configuration, etc..

Depending on the type of software package used, the Secretariat would provide users with the application run-time (or object) modules in order to respect the software vendor's copyright clauses.

(5) Types of media used for data dissemination

Data could be provided on the following media:

Magnetic tapes, in character mode EBCDIC and density 6250 bpi (files could also be created using ASCII character representation or density 1600 bpi).

PC diskettes could also be made available. For sequential files, standard formats could be designed to make possible the uploading of the information into commonly used PC software (spreadsheets, data base systems). Print-like files could also be made available on PC diskettes. In order to reduce the number of diskettes, the Secretariat will investigate data compression/decompression PC software available on the market. The Secretariat uses 3.5-inch high-density diskettes (1.4 megabytes). If necessary, the following types of diskettes could also be provided:

- 3.5-inch double-density (720 kilobytes)
- 5.25-inch high-density (1.2 megabytes)
- 5.25-inch double-density (360 kilobytes).

Other data distribution media, such as CD-ROM, could also be investigated.

User log query system:

This system will be similar to the conversion log file query system.

B. DATA BASE CONSIDERATIONS

1. Volume of information.

The following estimates of the volumes of data to be stored in the IDB are based on statistics obtained from the Tariff Study and the Harmonized System Common Data Base. In order to take into account the additional information which is stored in the IDB, these estimates have been adjusted using statistics obtained from the initial submissions received for the IDB. Factors which could substantially increase the estimates provided are:

- in the statistical file, imports by country of origin are broken down by tariff treatment (i.e. one country of origin could be recorded several times within the same statistical item),
- in the tariff file, specific duties will be recorded in percentage terms based on aggregate trade ("global" AVE's) and possibly, on bilateral trade ("bilateral" AVE's).

The following estimates are for one reporting country and one reference year.

Import statistics.

Tariff items : 10,000 national HS-based items.
Partner codes (plus partner aggregates): 20 country codes.
Total number of records: 200,000 (possibly up to 400,000 for some reporters); average length: 100 characters; 20 to 40 million characters.

Tariff information.

Coded tariff file:

Tariff items: 10,000 national HS-based items.
Duty types: two m.f.n. duties and two preferential duties.
Bilateral AVE's: possibly up to 45,000 (15 countries for 3,000 tariff items with specific rates).
Validity period: one period.
Record number: two types of records (record type "1" plus one other record for a fraction of the HS nomenclature).

Total number of records: 50,000 (possibly up to 150,000 with bilateral AVE's); average length: 70 characters; 5 to 10 million characters.

Textual tariff file:

Tariff items : 8,000 national sub-divisions of six-digit HS headings (descriptions of tariff items corresponding to six-digit HS are not required).
Element "02" (legal description): three lines
Element "09" (abbreviated description): two lines
Other elements: three per item.

Total number of records: 65,000; average length: 100 characters; 6 to 7 million characters.

Quantitative restrictions.

Coded QR file:

Tariff items : 3,000 national HS-based items.
Type of measure: one type, QR applied to imports.
Number of measures per item: one measure.
Record number: two types of records (nos. 1 and 3).

Total number of records: 6,000; average length: 70 characters; 4 million characters.

Textual QR file:

Tariff items: 500 national HS-based items (X items only).
Elements per tariff item: one element "09" - abbreviated description.
Number of text lines: three.

Total number of records: 1,500; average length: 100 characters; 150,000 characters.

Space requirements estimates for one reporter and one year.

Data storage: 35 to 55 million characters.

Additional storage required by the data base system management system (inverted lists for data access): 10 to 15 million characters.

Total estimated average:

- 50 million characters per reporter in the WIDB plus
- 50 million characters per reporter, times the number of years kept in the UIDB.

2. Access control

Users' access to the UIDB information will be controlled through passwords, by type of operations (read-write or read-only modes) according to an IDB access policy. The access controls will be installed through built-in security features of Adabas and through user locks installed by the Secretariat. Security features implementation and maintenance will be placed under the data base administrator in liaison with the data managers.

Access control will be performed as follows:

On year, reporter and sub-domain

On search commands and on-line submission of batch report programs

On the data downloading facility

It should be borne in mind that the possibilities of downloading data into PC's and creating machine-readable media will limit the control which the Secretariat can ensure on the dissemination of IDB information.

3. Hardware and software used for the IDB

Hardware

The IDB information and programs will reside on the equipment of the International Computing Centre in Geneva (ICC). The GATT Secretariat devices (terminals, control units) are linked to the Centre through modems and telephone lines. For more details about the ICC hardware and services, see note below. Personal computers located in delegations or in capitals, and connected to the ICC, could also be used as terminal units to access directly the IDB. This type of equipment could also be used, in local mode, to process IDB data downloaded from the ICC computer.

Software

The IDB project is currently developed using a data base management system:

Adabas from Software AG company. Other products of this company, based on Adabas technology, are used:

Natural 2, a fourth-generation programming language,

Super-Natural, a program and data views generator for non-professional data processing users,

Predict, an integrated data dictionary,

Natural Security System, to define security requirements.

IBM PL/I language will be used for coding functions not adapted to fourth-generation technology. These programs will be developed using IBM PDF Dialog Manager.

Note on the International Computing Centre

The Secretariat can provide the following detailed information about the International Computing Centre:

- a. Services provided by the Centre.
- b. Hardware configuration:
 - Processing units
 - Main storage units
 - Direct access and magnetic tape facilities
 - Teleprocessing facilities
- c. The CALL/ICC interactive network:
 - ICC's electronic mail service
 - On-line help and news services
 - Access to commercial or international organization-owned data bases
- d. Procedure to access the ICC through packet-switched networks
- e. Operational policy of the ICC:
 - Services availability
 - Procedure to authorize usage of the ICC facilities.

C. FUTURE DEVELOPMENTS

1. Summary files

Programs will be developed to produce analytical reports showing aggregated data. The aggregation process will be done according to the different levels of the HS nomenclature, by product categories and by stages of processing. It is expected that starting the aggregation processing from the level of tariff line data will entail high processing costs. Since the data subject to this process will be stable, recurrent costs should be avoided and for this reason, the Secretariat intends to store, in the UIDB, information aggregated at the HS six-digit level which is the lowest level of comparability among the reporting countries.

From this level, it will be possible to derive information according to higher HS levels. The aggregated information will be stored in "time-series" files which could be accessed on-line, for example, by HS six-digit number, year and reporter. These files will contain all the data elements needed by the report programs proposed in IDB/W/5.

2. Possibility of recording information for several years

The Secretariat envisages to store three years of tariff line information in the user data base. In this context, document IDB/Q 2 shows how the period of validity and the "historical" file could be used. However, it should be noted that, where the nomenclature changes from one year to another (split, regrouping, deletion), it will not be possible to calculate averages over the three-year period.

3. Inclusion of new types of data

The format provided in IDB/W/4 for the trade statistics file includes a "Direction of trade" code. For the time being, IDB submissions will contain data on imports only but the conversion phase programs have been designed with the view to process, if necessary, exports and re-exports as well.

The coding system which was adopted to define Quantitative Restrictions, (see document IDB/W/4/Add.1), can be expanded, if necessary, to include other non-tariff measures.