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DESIGN REVIEW OF TECHNICAL APPROACH

FBIS MODERNIZATION PROGRAM

2 OCTOBER 1984

CONTRACT No. 84X-927700-000

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A SUBSIDIARY OF TRW
SUNNYVALE, CALIFORNIA

1. INTRODUCTION AND AGENDA

FBIS CDP DESIGN REVIEW AGENDA

BRIEFER	TIME	ITEM
	DAY 1	
DAHLBERG	5	1. INTRODUCTION AND AGENDA
DAHLBERG	5	2. APPROACH TO PHASE II DESIGN
DAHLBERG	45	3. PUBLISHING SYSTEM VENDOR ANALYSIS
FRISBIE	120	4. BUREAU DESIGN
	LUNCH	
FRISBIE	30	4. BUREAU DESIGN (CONTINUED)
MAZZONI	150	5. HEADQUARTERS DESIGN
	DAY 2	
FORSTER	120	6. HEADQUARTERS DATA BASE DESIGN
DAHLBERG	15	7. PROGRAM RISKS
MITOOKA	30	8. TRAINING PLANS
	LUNCH	
MITOOKA	30	9. PROGRAM SCHEDULE
MITOOKA	30	10. PROGRAM COSTS
DAHLBERG	10	11. PLANS FOR PHASE III

2. APPROACH TO PHASE II DESIGN

APPROACH TO PHASE II DESIGN

- O REFINE OPS CONCEPT, INVESTIGATE FBIS USER NEEDS
- O STUDY DESIGN ARCHITECTURE TRADE-OFFS
- O ASSESS VENDOR CAPABILITIES
  - USER INTERVIEWS
  - FACTORY VISITS
  - DEMONSTRATIONS
  - LITERATURE SEARCH
  - INTERFACE COMPATIBILITY
- O BEGIN REQUIREMENTS TRACEABILITY MATRIX
- O ATTACK IMPORTANT HIGH LEVEL ISSUES, LEAVE DETAIL FOR LATER REFINEMENT
- O MODEL SYSTEM ON REPRESENTATIVE VENDOR TECHNOLOGY

3. PUBLISHING SYSTEM VENDOR ANALYSIS

AVAILABLE PUBLICATIONS SYSTEMS TYPES

USER TYPE	NEWSPAPERS, MAGAZINES	BOOKS, IN-HOUSE
USER POPULATION	LARGE (50+)	SMALL (1-10)
EDITORIAL CAPABILITY	STRONG	WEAK
COMPOSITION CAPABILITY	WEAK	STRONG
WYSIWYG	NO	YES
PAGINATION	WEAK	STRONG
LINE ART AND PHOTOS	NO	YES

FEATURES OF LARGE PUBLICATIONS SYSTEMS

- LARGE USER POPULATION
- EDITORIAL COPY FLOW CONTROL
- COMMUNICATIONS HANDLING
- WIRE SERVICE HANDLING
- EDIT TRACE
- MULTI-LEVEL USER PRIVILEGE
- FILE MANAGEMENT
- FLEXIBLE FILE ATTRIBUTES AND DIRECTORIES
- COMPOSITION TO GALLEYS OR AREAS
- SPLIT SCREEN
- DESIGNED TO PURPOSE
- REDUNDANCY FOR RELIABILITY

FEATURES OF SMALL PUBLICATIONS SYSTEMS

- EFFICIENT AUTOMATIC AND/OR INTERACTIVE BOOK PAGINATION
- GENERIC COMPOSITION MARK-UP
- REALISTIC SCREENS FOR SOFT COPY PROOF
- OUTPUT TO LASER PRINTER FOR HARD COPY PROOF OR LOW VOLUME REPRODUCTION
- GRAPHICS AND PHOTO HANDLING
- EFFICIENT MAN-MACHINE INTERFACE
- AUTOMATIC TABLE OF CONTENTS AND INDEX GENERATION

VENDOR SURVEY

- ATEX
- COMPOSITION SYSTEMS INC. (CSI)
- PENTA SYSTEMS INC.
- SYSTEMS INTEGRATORS INC. (SII)
- IBM PC-BASED PACKAGES
- XEROX 8010 MULTI-LINGUAL
- SMALL ADVERTISING SYSTEMS
  - BEDFORD (TEXT)
  - CAMEX (GRAPHICS)
  - IMAGITEX (IMAGES)
- SMALL GENERAL SYSTEMS
  - QUBIX
  - VIEWTECH
  - XYVISION
  - TEXET
  - INTRAN
- SOFTWARE PACKAGES
  - ADOBE
  - STUDIO SOFTWARE
  - WESTMINSTER
  - INTERLEAF

LARGE SYSTEM VENDOR HARDWARE

- o ATEX
  - MATURE HARDWARE
  - PARALLEL ARCHITECTURE
  - DEC PDP-11/34
- o CSI
  - MATURE HARDWARE
  - PARALLEL ARCHITECTURE
  - DEC PDP-11/44
  - DEC PDP-11/84
  - DEC VAX-11/780
- o PENTA
  - CURRENT PRODUCTION HARDWARE
  - DATA GENERAL MV/FAMILY
- o SII
  - CURRENT PRODUCTION HARDWARE
  - FAULT TOLERANT ARCHITECTURE
  - TANDEM TXP

LARGE SYSTEM POTENTIAL LIFECYCLE COSTS

- o ATEX
  - VERY HIGH POTENTIAL COSTS
  - MATURE HARDWARE
  - ONE MILLION LINES OF ASSEMBLY CODE
- o CSI
  - VERY HIGH POTENTIAL COSTS
  - MATURE HARDWARE
  - OVER TWO MILLION LINES OF ASSEMBLY CODE
- o PENTA
  - MODERATE POTENTIAL COSTS
  - CURRENT TECHNOLOGY HARDWARE
  - HIGH LEVEL LANGUAGE (PASCAL, FORTRAN)
- o SII
  - MODERATE POTENTIAL COSTS
  - CURRENT TECHNOLOGY HARDWARE
  - TABLE DRIVEN SOFTWARE

LARGE SYSTEM VENDOR EDITORIAL CAPABILITIES

- ATEX
  - MATURE SOFTWARE
  - GOOD EDIT TRACE
  - VERY GOOD EDITING
  - SAMPLE INSTALLATION: US NEWS AND WORLD REPORT, 500 USERS
- CSI
  - MATURE SOFTWARE
  - POOR EDIT TRACE
  - ADEQUATE EDITING
  - SAMPLE INSTALLATION: CLEVELAND PLAIN DEALER, 300 USERS
- PENTA
  - IMMATURE SOFTWARE
  - WAIT AND SEE ON QUALITY
  - NO LARGE EDITORIAL INSTALLATIONS
- SII
  - STATE-OF-THE-ART SOFTWARE
  - EXCELLENT EDIT TRACE
  - VERY GOOD EDITING
  - SAMPLE INSTALLATION: LOS ANGELES TIMES, 500 USERS

LARGE SYSTEM VENDOR COMPOSITION CAPABILITIES

- ATEX
  - MATURE SOFTWARE
  - GALLEY AND AREA COMPOSITION, NEWSPAPER TYPE
  - NO BOOK STYLE PLANNED
  - WYSIWYG PAGE COMPOSITION IN DEVELOPMENT
- CSI
  - NEEDS MORE INVESTIGATION
  - MATURE NEWSPAPER SOFTWARE
  - AREA COMPOSITION STYLE
- PENTA
  - MATURE SOFTWARE
  - PRIME CUSTOMER AREA IS BOOKS
  - POSSIBLE "BEST OF THE FOUR" FOR BOOK STYLE PAGINATION
- SII
  - UNDER DEVELOPMENT
  - NOT A CUSTOMER CONCERN

SMALL SYSTEM VENDOR HARDWARE/SOFTWARE

- TYPICALLY 68000 CPU RUNNING UNIX-LIKE OPERATING SYSTEM WITH APPLICATION CODED IN "C"

- PORTABILITY EASES CONCERN ABOUT LIFECYCLE COSTS

SMALL SYSTEM VENDOR COMPOSITION CAPABILITIES

- QUBIX
  - DESIGNED FOR CAPTURE AND RE-USE OF EXISTING LINE ART AND TEXT FROM CAD AND SCANNER INPUTS

- VIEWTECH
  XYVISION
  TEXET
  - DESIGNED FOR FULL TEXT AND INTEGRATED LINE AND PHOTO ART
  - BOOK COMPOSITION AND PAGINATION

- INTRAN
  - CAPTURES LINE ART AND PHOTOS
  - ALLOWS GRAPHICS EDITING WITH POSITIONING, SIZING, ROTATION, AND RETOUCH AT PIXEL LEVEL
  - PERFORMS STORAGE COMPRESSION ON LINE ART
  - LIMITED TEXT HANDLING

VENDOR EVALUATION CRITERIA

- FUNCTIONAL
  - REQUIREMENTS
  - DESIGN RISK FOR INTERFACE, SOFTWARE
  - SUBJECTIVE (E.G. USER FRIENDLY)

- PROGRAMMATIC
  - LIFE CYCLE SUPPORT (E.G. DEC J11 CHIPS)
  - VENDOR SURVIVAL

PC NETWORKS

- EASILY SUPPORTED IN THE FIELD
- NETWORK TECHNOLOGY IS AVAILABLE
- MODULAR TRANSITION CAN BE ACHIEVED
- RELIABLE BECAUSE OF DISTRIBUTED CPU'S
- LARGE BODY OF EXISTING AND CONTEMPLATED SOFTWARE FOR TEXT AND GRAPHICS PROCESSING, MANAGEMENT, AND ADMINISTRATIVE TASKS
- OPEN TO ADAPTATION, INTERFACING, AND PROGRAMMING
- EASY TO UPGRADE IN THE FIELD

PUBLISHING VENDOR SELECTION CONCLUSIONS

- NO CLEAR WINNERS ON FUNCTIONAL BASIS
- NEEDS FURTHER RESEARCH TO COMPARE PROGRAMMATICS
- PC NETWORK IS A GOOD BUREAU FIT
- XEROX 8010 IS KEY TO MULTILINGUAL TEXT PROCESSING

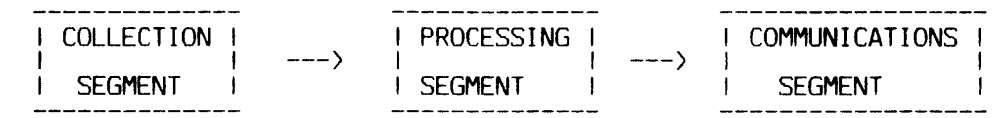
4. BUREAU DESIGN

	# VUGRAPHS
O REQUIREMENTS STATUS & ANALYSIS UPDATE	1
O BUREAU DESIGN OVERVIEW - BUREAU SEGMENTATION - REQUIREMENTS ALLOCATION - BUREAU SUBSYSTEMS - DRIVING REQUIREMENTS - DESIGN HIGHLIGHTS	5
O BUREAU DESIGN APPROACH - GENERAL DESIGN PROCESS - DESIGN EVALUATION CRITERIA - PRIMARY DESIGN ALTERNATIVES - EVALUATION OF PRIMARY DESIGN ALTERNATIVES - BASIS OF ARCHITECTURE/VENDOR SELECTION	16
O BUREAU DESIGN - OVERALL DESIGN - COLLECTION SEGMENT - PROCESSING SEGMENT - COMMUNICATION SEGMENT	36
O RISKS/DEFICIENCIES	2
	60

REQUIREMENTS ASSUMPTIONS

- 0 SEC. 2.1.1.1 [EXHIBIT E: PRESS AGENCIES]
  - ALL ASSUMPTIONS MADE ON THE LANGUAGE/ALPHABET OF TRANSMISSION ARE INCLUDED UNDER BUREAU COST & SIZING
- 0 SEC. 2.2.1.1.2.2 [FREQUENCY FOLLOWING]
  - ASSUME THAT THE GFE RECEIVERS FULFILL THE DESIRED CAPABILITY
- 0 SEC. 2.5 [BUREAU DATA BASE AND USER SUPPORT] -- SIMPLY REFERENCES HEADQUARTERS SECTION FOR DATA BASE AND TEXT PROCESSING REQUIREMENTS
  - USED COMMON SENSE TO ASSUME WHICH REQUIREMENTS DO, OR DO NOT, APPLY TO BUREAUS
  - ANY REQUIREMENTS ERRONEAOUSLY EXCLUDED FROM THE DESIGN CAN BE ADDED IN AS PART OF PHASE III WORK
- 0 SEC. 3.8 [SIGNAL INTERFACES]
  - DESIGN ASSUMES GFE RECEIVERS, IEEE-488 BUS COMPATIBLE
  - ASSUMES RECEIVER OUTPUT IS AN ANALOG AUDIO SIGNAL
- 0 SEC. 3.9 [INTERFACES: ANTENNAS]
  - DESIGN ASSUMES THAT THE INTERFACE TO THE GFE ANTENNAS ARE COAX LEADS THAT CAN BE ATTACHED TO A COMPUTER-CONTROLLED SWITCH
  - ASSUMES THAT COAX LEADS ARE ALL BROUGHT TOGETHER IN ONE PHYSICAL LOCATION
  - DESIGN ASSUMES THAT THE COMPUTER-CONTROLLED SWITCH WILL SUPPLY SIGNALS TO GFE RECEIVERS
- 0 SEC. 3.X [INTERFACES: COMMUNICATIONS]
  - ASSUME THAT COMMUNICATIONS INTERFACE IS TO GFE EQUIPMENT

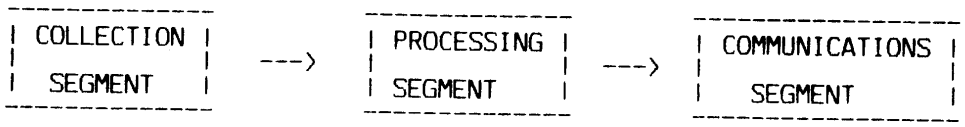
BUREAU SEGMENTATION



MAPPING OF FUNCTIONS FROM THE BASELINE DESCRIPTION TO SEGMENTS:

1.2 COLLECTION (PART)	1.4 MONITORING	1.9 MESSAGE PROCESSING
1.3 INTERNAL DISTRIBUTION	1.5 SELECTION	
1.12 CRUISING	1.6 TRANSLATION	
	1.7 EDIT	
	1.8 DISSEMINATION ASSIGNMENT	
	1.10 PROOFING	
	1.11 TRAINING	
	1.13 ADMINISTRATIVE OPERATIONS	
	(1.14) MAINTENANCE	
	1.2 COLLECTION (PART)	

ALLOCATION OF REQUIREMENTS

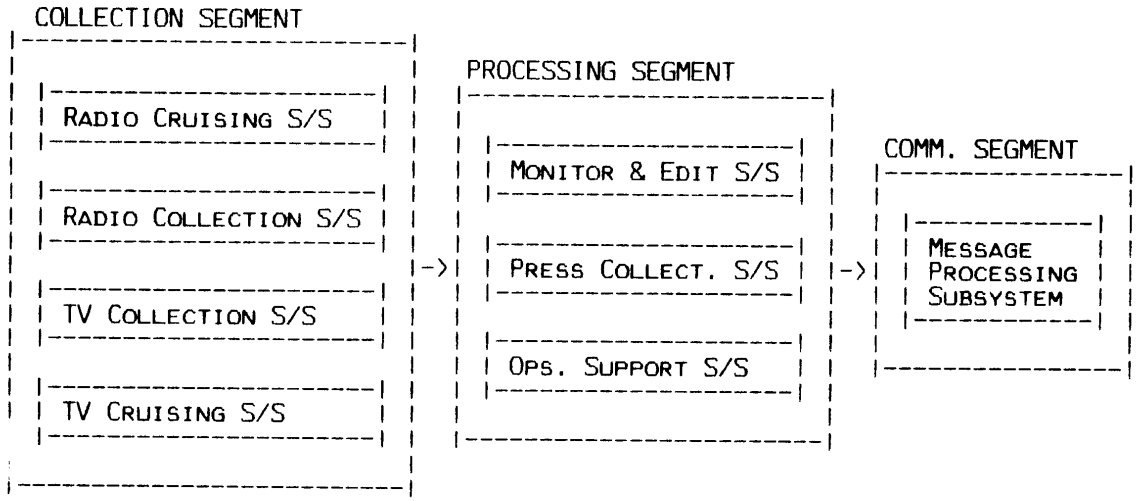


ALLOCATION OF BASELINE REQUIREMENTS TO BUREAU SEGMENTS:

2.2 COLLECTION	2.3 PROCESSING	2.4 PUBLISHABLE TRAFFIC DISSEMINATION
2.2.1.1 RADIO	2.5 DATA BASE & USER SUPPORT	2.6 MESSAGE TRAFFIC SUPPORT
2.2.1.3 TELEVISION	2.2 COLLECTION	
	2.2.1.2 PRESS	
	2.2.1.4 PUBLICATIONS	

NOTE: PRESS WIRE AND PUBLICATIONS COLLECTION [2.2.1.2 & -.4] ARE ALLOCATED TO THE PROCESSING SEGMENT BECAUSE OF THE SIMILIARITY IN EQUIPMENT REQUIRED TO PROVIDE THE NECESSARY CAPABILITIES.

BUREAU SUBSYSTEMS



DRIVING REQUIREMENTS

- Collection Segment
  - Recording of Broadcast (Analog) Material
  - Management of Broadcast Material
  - Availability
  - Maintainability
- Processing Segment
  - Inter-Terminal Message (Translated Items) Communications
  - Display, and Edit, of Foreign Languages in Non-Roman Alphabets
  - Edit/Trace
  - Availability
  - Maintainability
- Communications Segment
  - Availability
  - Maintainability

DESIGN HIGHLIGHTS

COLLECTION SEGMENT

- RADIO CRUISING
  - AUTOMATED SCANNING AND ANALYSIS OF HF SPECTRUM FOR BROADCASTING STATIONS
  - AUTOMATED COLLECTION OF A CRUISING LOG
- RADIO COLLECTION
  - COMPUTER CONTROLLED SELECTION AND TUNING OF RECEIVERS
  - COMPUTER INITIATED RECORDING OF BROADCASTS
- TV CRUISING AND COLLECTION
  - SUPPORTED BY PC WORKSTATION

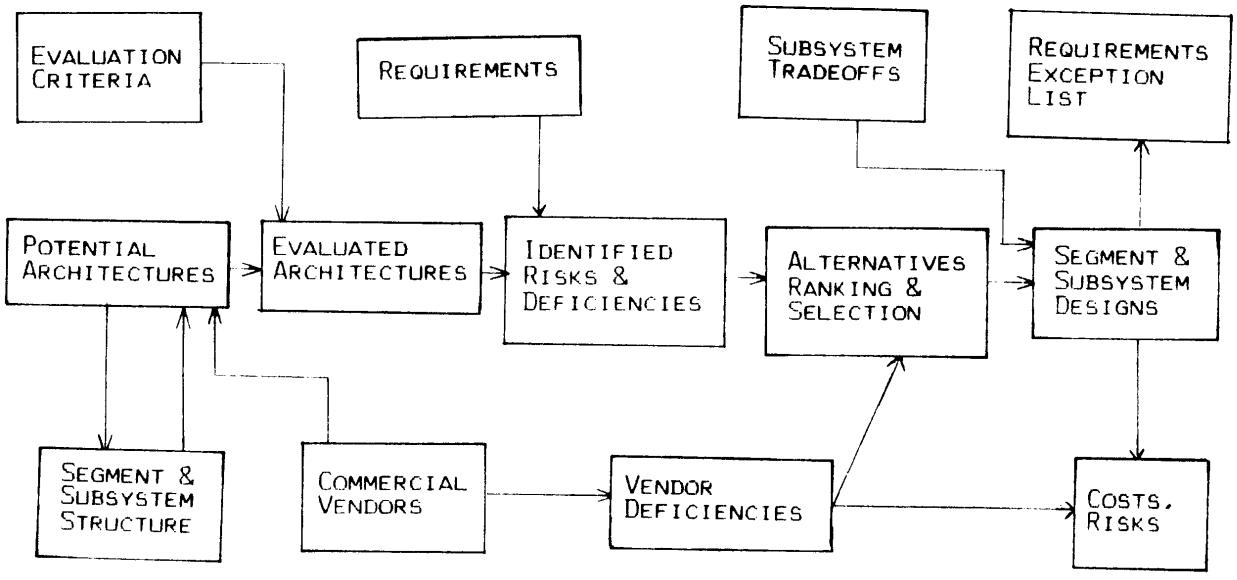
PROCESSING SEGMENT

- MONITORING
  - PERFORMED ENTIRELY IN SOFTCOPY AT A NETWORKED WORKSTATION
  - FOREIGN LANGUAGE WIRE SERVICES CAN BE EXAMINED IN SOFTCOPY AT A SPECIAL, FOREIGN-LANGUAGE, WORKSTATION
- EDITING
  - PERFORMED IN SOFTCOPY AT A PC WORKSTATION
- PRESS AGENCY COLLECTION
  - COLLECTED AND STORED IN SOFTCOPY
- PUBLICATION COLLECTION; ADMINISTRATION; TECHNICAL SUPPORT
  - SUPPORTED BY PC WORKSTATION

COMMUNICATIONS SEGMENT

- GFE FACILITIES NEED NOT BE CHANGED, EXCEPT FOR THE INTERFACE

BUREAU DESIGN APPROACH



DESIGN EVALUATION APPROACH

- Evaluation of Specified (SDS-002A) Requirements
  - Candidate Designs are Evaluated Primarily on a Yes/No Basis of Whether Requirements are Satisfied -- Not Based on Percentage of Satisfaction
  - Only Design Deficiencies or Excesses are Weighted -- all Satisfied Requirements are Treated Equally

- Evaluation of Programmatic "Requirements"
  - All Other Things Being Equal, Individual Programmatic Requirements Are Used to Differentiate Designs
  - Candidate Designs are Scored on Each Requirement
  - Programmatic Requirements are Assigned Relative Weights

DESIGN EVALUATION CRITERIA (1 OF 2)

- Functional Requirements
  - Design Should Satisfy System Requirements Exactly, According to SDS-002A Specifications
  - Design Should Include Requirements Missing From SDS-002A; Sponsor to be Notified of Missing Requirement via RFC
  - Design Should Meet Perceived Understanding of Requirements; SDS-002A Language Issues to be Worked with Sponsor
  - Any Requirements not Possible to Satisfy are Noted
  - Satisfaction of Requirements in Excess of Specifications is Also Noted: These are Considered Design Features

- Performance Requirements and Design Requirements
  - Same Evaluation Approach as for Functional Requirements
  - Few Performance or Design Requirements are Cited; Attempt to Derive Where Necessary

DESIGN EVALUATION CRITERIA (2 OF 2)

- Programmatic "Requirements":
  - Productivity:
    - Promote Long-Term Reduction of Operational Costs
    - Provide New Services to FBIS Customers
  - Risk: Keep Technical Risks Low (Minimize Risks)
  - Flexibility: Permit Addition of New/Extended System Capabilities
  - Growth: Allow System Capacity to be Increased Easily
  - Modularity: Permit Configuration to be Tailored to Each Bureau
  - Transition: Facilitate Bureau Introduction Without Work Disruption
  - Training: Promote a Design Whose Operation is Easy to Learn
  - Maintenance: Promote Ease and Simplicity of Maintenance
  - Marketability: Take into Account Acceptibility by Eventual Users
  - Costs: Keep Acquisition Costs Reasonable
  - Compatibility:
    - Provide Compatibility with Equipment at Headquarters
    - Provide Compatibility of Equipment Between Bureaus
    - Provide Compatibility with GFE Bureau Equipment
  - Facilities: Minimize Impact of Facilities Changes on Bureaus

BUREAU DESIGN ALTERNATIVES

- For the Processing Segment, 3 Classes of Architecture were Seriously Considered:
  - "Dual-Host": An Architecture Characterized by Software That Runs Primarily on a Mini-Computer Host
  - "D.C.-Host": Same as the "Dual-Host", but the Host is Remotely Located [Could be a Single Host Based in D.C. or Centrally-Located Machines that Support Several Bureaus Within a Geographic Region]
  - "No-Host": An Architecture Consisting of Intelligent Workstations Networked Together That Run Most Software Internally for Self-Sufficiency
- Other Alternatives were Eliminated from Serious Consideration:
  - Single Host: Would not Provide a Sufficient Guarantee of Equipment Availability
  - Stand-Alone Workstations: Could not Support Automatic Routing of Data Between Workstations
- For the Collection Segment, Design Alternatives Occur at the Subsystem Level and are Discussed Later

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FBIS – "NO-HOST" ARCHITECTURE

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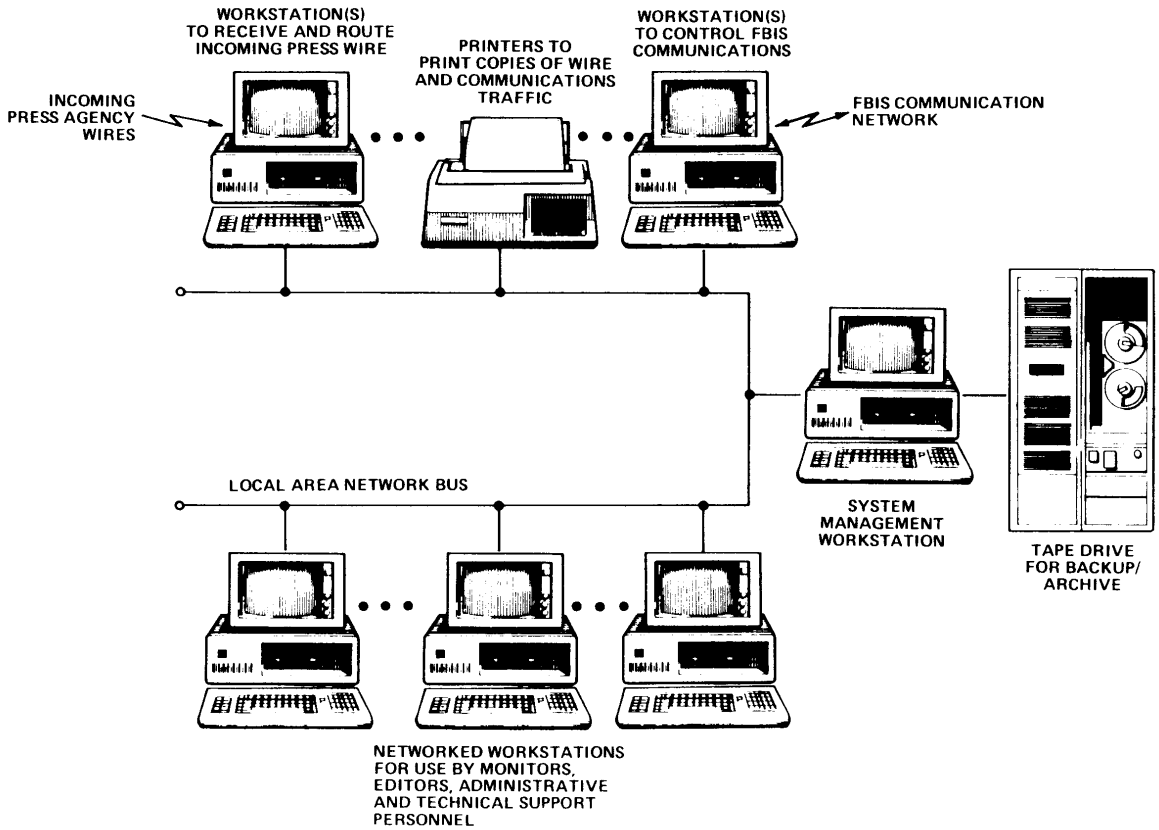

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NO "HOST" ARCHITECTURE ADVANTAGES

- Easiest way to Obtain Multi-Lingual Functionality
- Vendors Have a Range of Office Automation Software Available
- Has Inherently High Availability and Built-in Redundancy; Simple Matter to Increase Amount of Redundancy
- Risk: Most Text Processing Functions are Readily Available; Some Intercommunication and Extended Text Processing Functions Require Varying Amounts of Development
- Flexibility: Bus Network Permits Incorporatation of New Products
- Growth: Simple to Add Additional, Individual Workstations
- Modularity: Modular at Workstation Level Permits Tailored Configuration of Each Bureau
- Transition: Simplified by Modularity at Workstation Level
- Maintenance: Uncomplicated by Large Amounts of Equipment
- Facilities: Imposes Only Moderate Power and Space Requirements

"NO-HOST" ARCHITECTURE DISADVANTAGES

- O Built to Support Office Automation -- Vendors Lack Some Features of Systems Specifically Designed to Support Editorial Functions:
  - Automatic Message Routing
  - Edit/Trace
  - Reception of Wire Services
  - Communications Handling
- O Lack of Host Machine Complicates Control of Office Databases
- O Lack of Host Complicates Backups and Archiving of Old Traffic
- O Compatibility: Likely to be Different Equipment than at Headquarters -- Would Necessitate Additional Training for Editors

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FBIS – "DUAL-HOST" ARCHITECTURE

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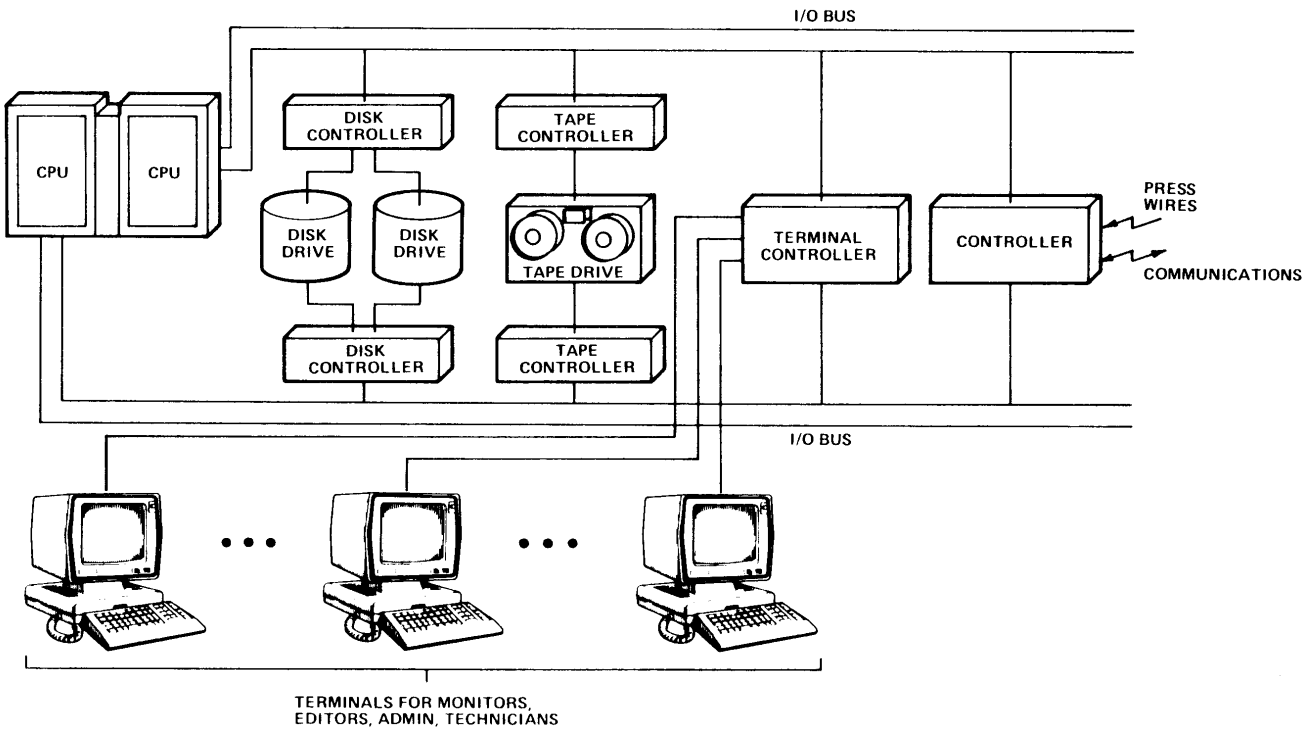

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"DUAL-HOST" ARCHITECTURE ADVANTAGES

- Vendors Supply Excellent Text Processing and Intercommunications
- Vendors Provide Good Support for Wire Services and Communications
- Redundant Processors Provide Necessary Equipment Availability
- Central Host Machine Simplifies Control of Common Files
- Central Host Machine Expedites Backup and Archival Procedures
- Risk: Low, Because Almost all Desired Functions are Available from a Single Vendor
- Growth: Simple Matter to Add Additional Terminals
- Training: Available from the Vendor
- Compatibility: Likely to be Same Equipment as at Headquarters

"DUAL-HOST" ARCHITECTURE DISADVANTAGES

- MAINTENANCE: REQUIRES SUBSTANTIAL TRAINING AND EXPERTISE
- VENDORS DO NOT PROVIDE MUCH MULTI-LINGUAL SUPPORT
- VENDORS DO NOT SUPPLY MUCH OFFICE AUTOMATION SOFTWARE
- FACILITIES: REQUIRES A SPECIAL COMPUTER ROOM
- FLEXIBILITY: DIFFICULT TO INCORPORATE NEW PRODUCTS FROM OTHER VENDORS
- MODULARITY: MINIMAL SIZE SYSTEM CAN HANDLE LARGEST BUREAUS -- WOULD BE OVERKILL FOR SMALLER BUREAUS
- TRANSITION: MUST INTRODUCE NEW EQUIPMENT ALL-AT-ONCE

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FBIS – "D.C.-HOSTED" ARCHITECTURE

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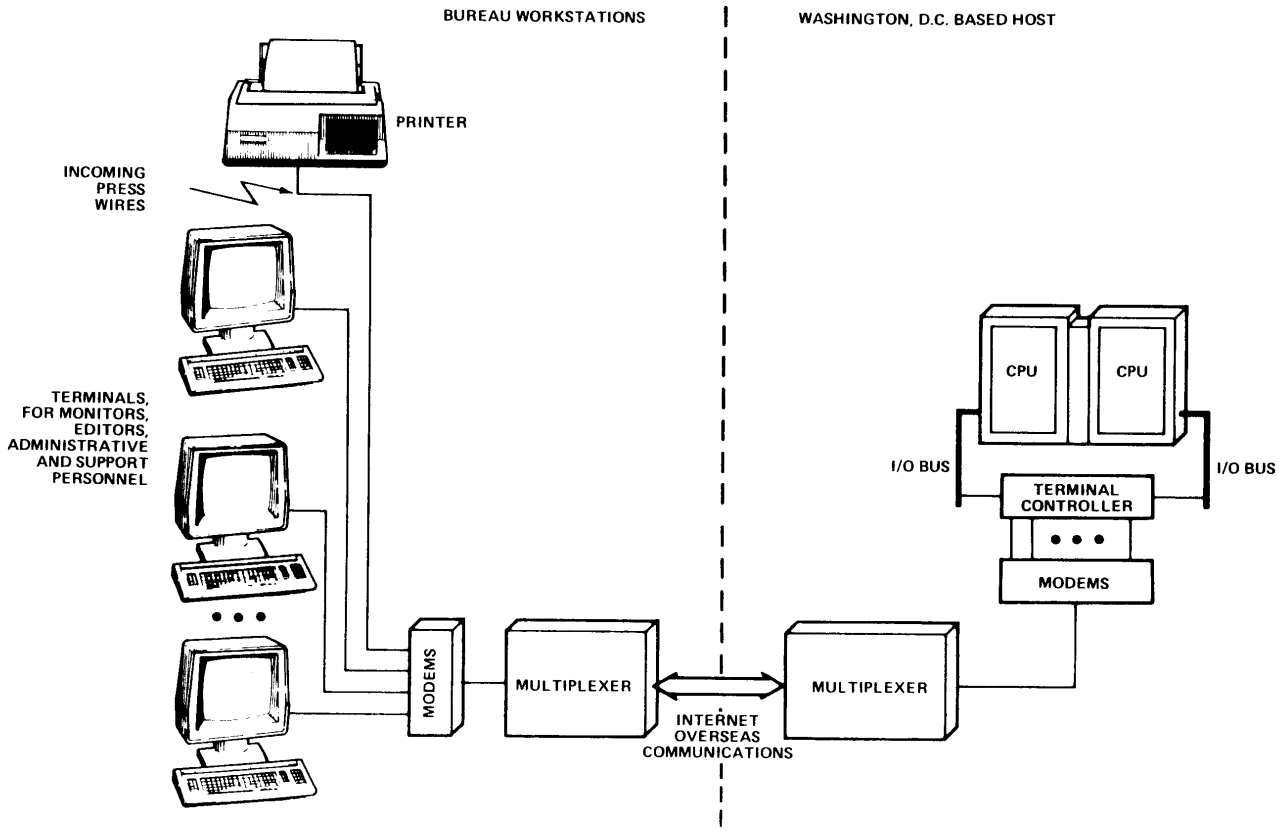

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CENTRALIZED (D.C.) HOST

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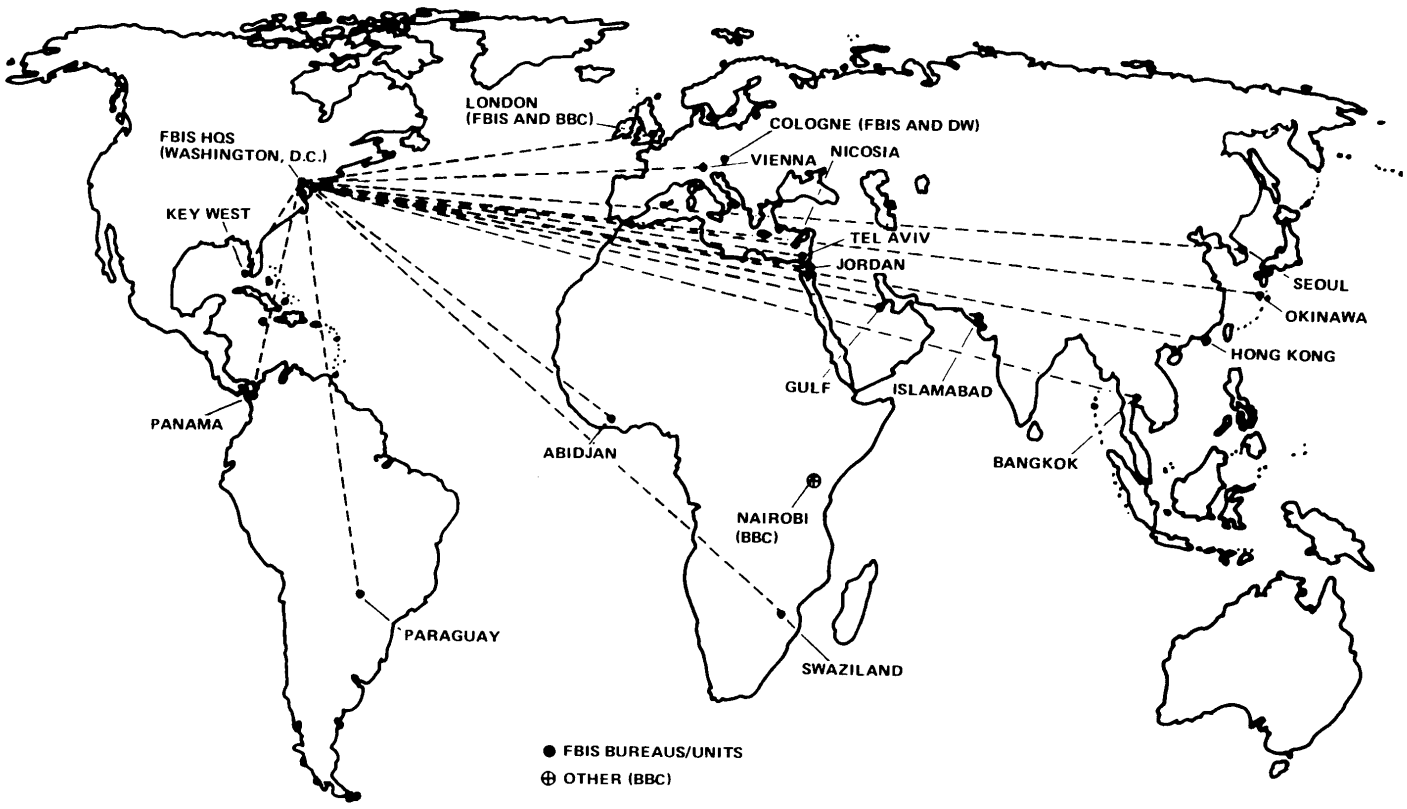

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REGIONAL HOSTS

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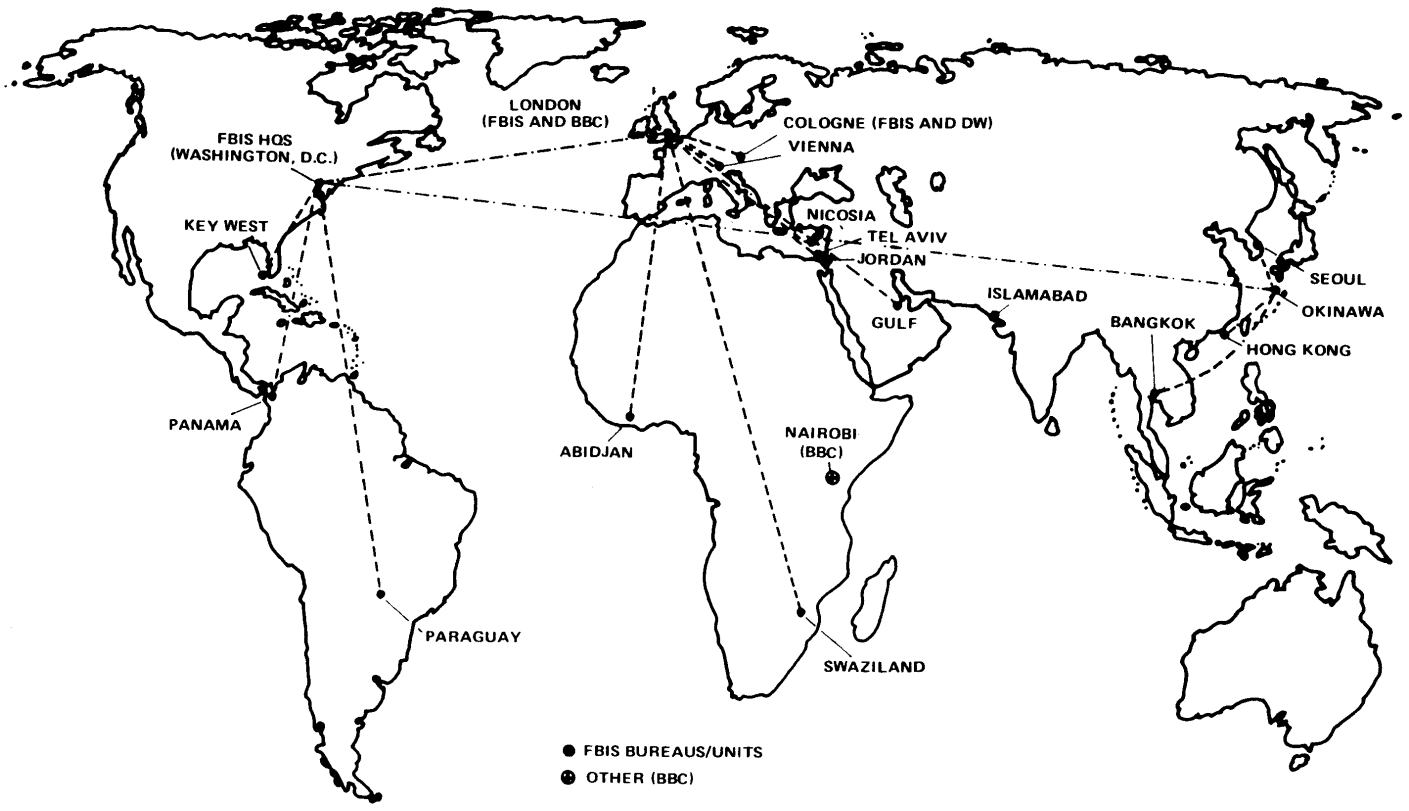

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"DC-HOST" ARCHITECTURE EVALUATION

THIS ARCHITECTURE IS SIMILIAR TO THE "DUAL-HOST", BUT HAS ADDITIONAL ADVANTAGES AND DISADVANTAGES:

ADVANTAGES

- REDUCED AMOUNT OF HARDWARE AT EACH BUREAU MINIMIZES MAINTENANCE
- FACILITY REQUIREMENTS ARE SIMPLIFIED TO EQUAL "NO-HOST" APPROACH
- NEED FOR SYSTEM MANAGEMENT AT EACH BUREAU IS ELIMINATED
- FOSTERS BETTER COMMUNICATION BETWEEN HEADQUARTERS AND BUREAUS
- MODULARITY IS IMPROVED THROUGH USE OF FEWER COMPUTERS

DISADVANTAGES

- CREATES AN EXPENSIVE ADDITIONAL COMMUNICATIONS REQUIREMENT [CAN BE CONTROLLED THROUGH USE OF INTELLIGENT TERMINALS, SHARED USE OF COMMUNICATIONS, AND EMPLOYMENT OF REGIONAL HOSTS]
- REQUIRES RELIABLE COMMUNICATIONS; INCREASES RISK TO AVAILABILITY
- CREATES ISSUES ABOUT WHETHER THE PRESS AGENCY WIRES CAN BE BROUGHT IN IN SOFTCOPY

COMPARISON OF ARCHITECTURE ALTERNATIVES

	NO-HOST	DUAL-HOST	DC-HOST
FUNCTIONALITY:			
	= COMM. SOFTWARE	+ COMM. SOFTWARE	+ COMM. SOFTWARE
	= EDIT/TRACE	+ EDIT/TRACE	+ EDIT/TRACE
	+ MULTI-LINGUAL	- MULTI-LINGUAL	- MULTI-LINGUAL
	+ OFFICE SOFTWARE	- OFFICE SOFTWARE	- OFFICE SOFTWARE
RISK:	= LOW DEVELOPMENT	+ OFF-THE-SHELF	- OPERATIONAL
MAINTENANCE:	+ REPLACE MODULES	- SKILLED TECHNICIAN	+ REPLACE MODULES
COSTS:	+ LOWEST COST	- HOST ADDS COST	- COMM. COSTS
FACILITIES:	+ MINIMAL IMPACT	- MACHINE ROOM	+ MINIMAL IMPACT
COMPATIBILITY:	- DIFF. THAN D.C.	+ SAME AS D.C.	+ SAME AS D.C.

- THE THREE ARCHITECTURES WERE ALL JUDGED SATISFACTORY AND BASICALLY EQUIVALENT ON CRITERIA FOR: MARKETABILITY, FLEXIBILITY, GROWTH, TRANSITION, TRAINING, MODULARITY, AND PRODUCTIVITY.
- BASED ON OUR PERCEPTION OF FBIS PRIORITIES, THE "NO-HOST" DESIGN APPROACH WAS SELECTED
- THE "NO-HOST" ARCHITECTURE WAS SELECTED BECAUSE IT PROVIDES THE MOST MODERNIZATION BENEFITS WHILE MINIMIZING RISKS (OF ALL TYPES)

RADIO CRUISING SUBSYSTEM

- Purpose
  - Search for New or Improved Quality of HF Broadcast Signals
  - Process, Log, and Display the Results to the Cruising Operator
  - Record and Monitor Demodulated Audio Signals as Determined by the Cruising Operator

- Automated Cruising Allows:
  - Simultaneous Tracking of Signals of Interest
  - Independence from Collection Operations
  - Cruising Operator to Monitor and Record Signals While Data Is Being Collected

RADIO CRUISING FUNCTIONAL REQUIREMENTS

- Perform a Search of the HF Band Using All (or a Subset) of the Antennas
- Perform a General Search of the HF Band
- Perform a Directed Search of the HF Band
- Obtain Magnitude vs Frequency Data
- Obtain Duration vs Frequency Data
- Log Data
- Report Data
- Record Signals
- Monitor Signals

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FBIS–RADIO CRUISING SUBSYSTEM BLOCK DIAGRAM

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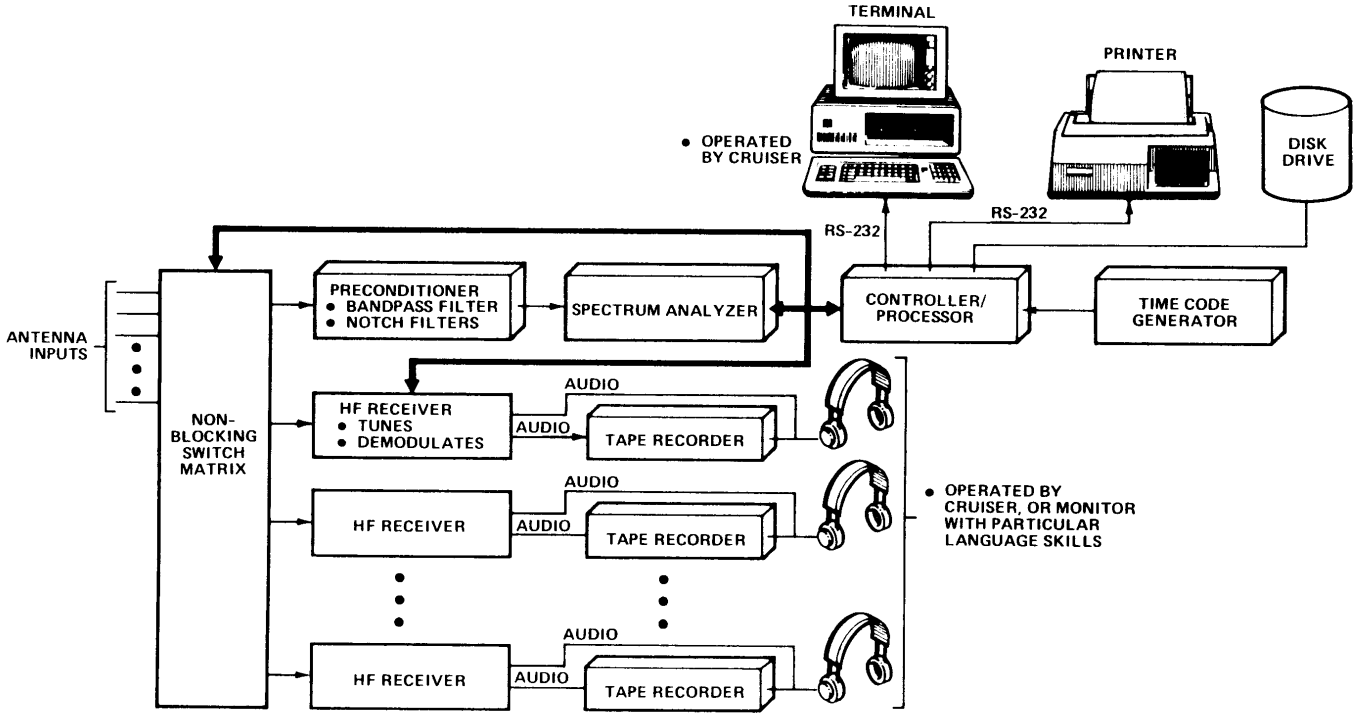

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CRUISING EQUIPMENT

ANTENNA SELECTION

- Allows Automatic or Manual Selection of Antenna
- Implemented With a M Input by N Output Non-Blocking Switch Matrix
- Switch Matrix is Controlled by IEEE 488 Bus

SIGNAL PRECONDITIONER

- Bandlimits Input Signal
- Notch Filters Remove Major Interferers

SPECTRUM DISPLAY

- Scans Band of Interest and Produces a 1024 Point Display of the Power Spectrum
- Outputs the Display to the Controller
- Spectrum Analyzer is Controllable from the IEEE 488 Bus

IMPLEMENTATION

- Hardware Required Consists of Mainly Off-The-Shelf Equipment
- Algorithms Have Been Developed and Used by ESL on Other Programs

GENERAL SEARCH SCENARIO

- o Select Antenna(s)
- o Select Band(s) of Interest
- o Detect Signals Above a Threshold Within the Band
- o Repeat Process for all Antennas
- o Log Data for Each Signal and for Each Antenna:
  - Time of Occurrence
  - Duration of Broadcasts (Accumulated Occurrences)
  - Amplitude of Each Signal
  - Antenna Configuration
  - Carrier Frequency

DIRECTED SEARCH SCENARIO

- o Select Antenna(s)
- o Select Signals of Interest
- o Detect Signals Above a Threshold Within the Band
- o Repeat Process for all Antennas
- o Log Data for Each Signal and for Each Antenna
  - Time of Occurrence
  - Duration of Broadcasts
  - Amplitude of Each Signal
  - Antenna Configuration
  - Carrier Frequency

PROCESSING

FOR EACH SCAN:

- Use a Rank-Selected Noise Level Estimator to Determine the Noise Level and to Set the Threshold
- Consider All Values Above the Threshold to be a Signal of Interest
- Perform Median Filtering to Eliminate Noise Spikes
- Perform Spectral Peak Picking to Identify the Center Frequency of Each Active Signal
- Discard All Signals Not of Interest

RADIO CRUISING MENU

1. PERFORM GENERAL SEARCH

2. PERFORM DIRECTED SEARCH

3. DISPLAY DAILY LOG

4. DISPLAY ACCUMULATED LOG

PERFORM GENENERAL SEARCH MENU

---

1. General Search

   A. Set Configuration Parameters

   B. Recall Configuration Files

   C. Generate Configuration Files

   D. Set Masking Parameters

   E. Run General Search

PERFORM DIRECTED SEARCH MENU

---

2. DIRECTED SEARCH

   A. SET CONFIGURATION PARAMETERS

   B. RECALL CONFIGURATION FILES

   C. GENERATE CONFIGURATION FILES

   D. SET ACS RECEIVER/TAPE RECORDER PARAMETER

   E. RUN DIRECTED SEARCH

CONFIGURATION FILE MENU

FREQUENCY RANGE (KHZ)		SWEEP (YES/NO)	ANTENNA	USE (YES/NO)
148.5	283.5		1	
525	1606.5		2	
2300	2495		3	
3200	3400		4	
3900	4000		5	
4750	5060		6	
5950	6200		7	
7100	7300		8	
9500	9775		9	
11700	11975		10	
15100	15450			
17700	15450			
21450	21750			
25600	26100			

REPORTING LOG FILE

- THE SUBSYSTEM CONTROLLER WILL LOG THE FOLLOWING DATA:
  - TIME OF OCCURRENCE
  - DURATION OF OBSERVANCE
  - MAGNITUDE OF EACH SIGNAL
  - ANTENNA CONFIGURATION INFORMATION (E.G., SIGNAL STRENGTH VS ANTENNA)
  - CENTER FREQUENCY OF EACH SIGNAL

- THE CRUISER CAN PROVIDE ANNOTATIONS TO BE KEPT IN THE FILE BY SIGNAL

- ASSUMES ONLY ONE STATION BROADCASTS ON A PARTICULAR FREQUENCY

MAGNITUDE VS. FREQUENCY DISPLAY

FREQUENCY (KHZ)	MAGNITUDE (1-10)	ANTENNA	COMMENTS
155	5	1	MODULATION TYPE, QUALITY, STABILITY, ETC.
173	8	5	
236	7	3	
540	6	4	
882	9	2	
2300	4	5	
3380	5	7	
4825	10	6	
4930	7	9	
6015	8	8	
•	•	•	
•	•	•	
•	•	•	

DURATION VS. FREQUENCY DISPLAY

FREQUENCY (KHZ)	OBSERVANCE 0000000000000000000011111111111111111111222222222 0011223344556677889900112233445566778899001122334 0303030303030303030303030303030303030303030303030	START TIME	STOP TIME
155	XXXXXXXXXXXXXXXXX	12:00	20:30
173	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	07:30	22:30
236	XXXXXXXXXXXX	17:00	27:00
540	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX		
882	XXXXXXXXXXXXXXXXXXXX	09:00	19:30
2300	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	07:00	22:30
3380	XXXXX	12:00	14:00
4825	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	03:00	21:00
4930	XXXXXX	16:00	18:30
6015	XXXXX XXXXXX XXXXX	04:30	21:30

RECORDING & MONITORING

- Cruising Recorders Support Evaluation of New Sources for Quality Analysis
- Each Receiver Will Have its Audio Output Routed to a Tape Recorder
- Automatic Tape Recording Can Be Initiated by the Subsystem Controller
- Individual Signals Can Be Monitored Using the Receivers
- Tape Recorder Outputs Can Be Monitored

RADIO COLLECTION SUBSYSTEM

- Purpose
  - Antenna, Receiver, and Recorder Selection
  - Receiver Tuning
  - Automatic Recording
  - Automatic Logging of Radio Broadcast Collections
- Implementation
  - Install a Computer-Controllable HP Antenna Switch
  - Use Existing HF Receivers for Collection
  - Replace (TBR) Existing Recorders with Cassette Recorders that can be Computer-Controlled
  - Install a Computer Responsible for Collection, According to a Boardman File
  - Build and Maintain a Radio Collection Log in Softcopy

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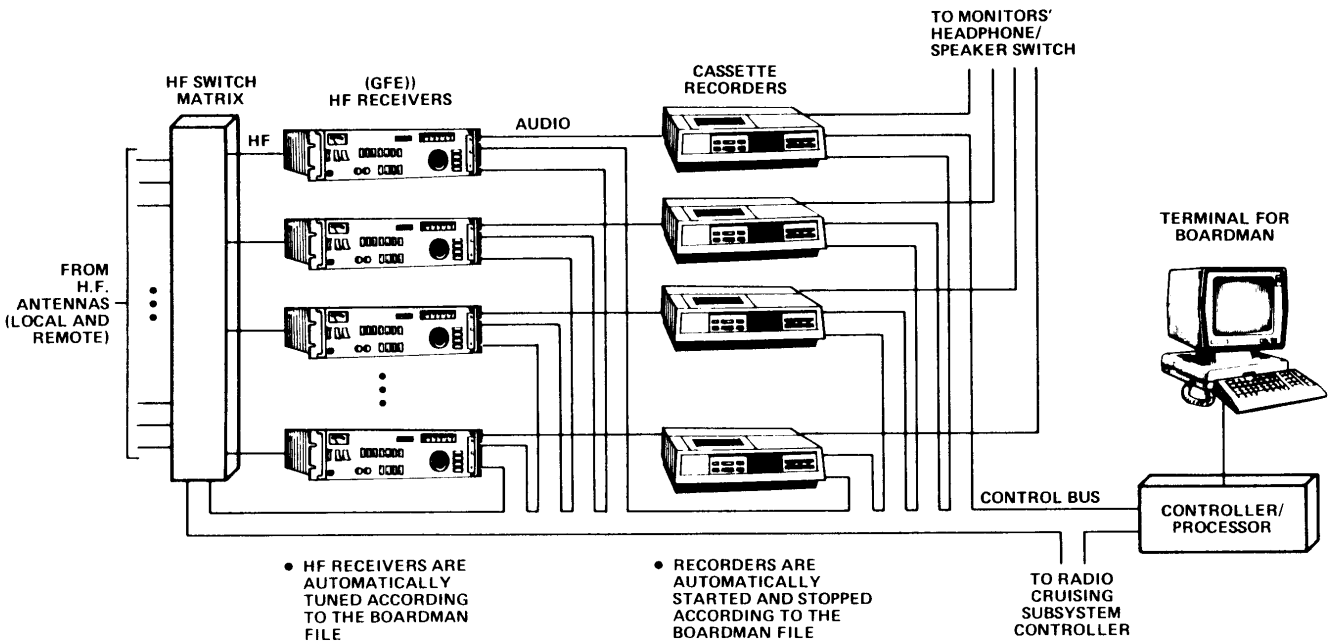
RADIO COLLECTION SUBSYSTEM BLOCK DIAGRAM

TRW



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HF SWITCH MATRIX

- Shared With Radio Cruising Subsystem
- Implemented as an M Input by N Output Non-Blocking Switch Matrix
- Computer Controlled via an IEEE 488 Bus
- Also Manually Controllable

HF RECEIVERS

- GFE of Watkins-Johnson 8718 HF Receivers
- Computer Controllable via an IEEE 488 Bus

CASSETTE RECORDERS

- At a Minimum, Externally Controllable for Start & Stop
- Use Recorder's Monitoring Output to Feed Live Broadcasts to Monitors

CONTROL PROCESSOR

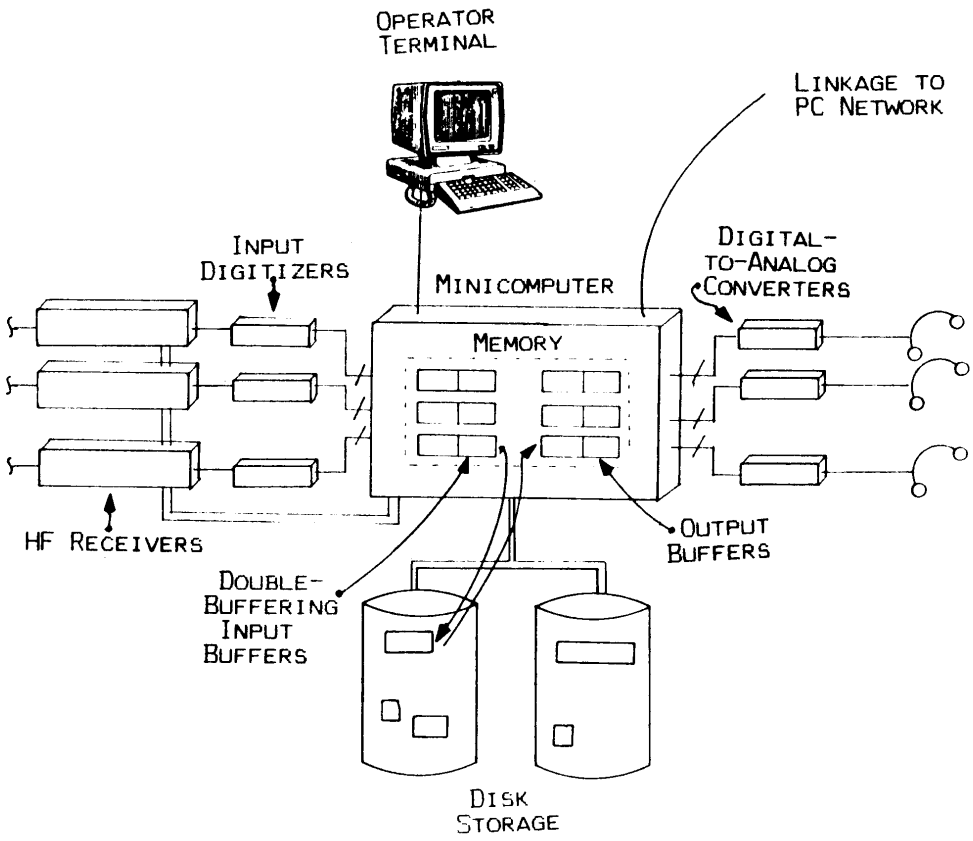
- Small Minicomputer with Terminal for Boardman
- Controls the Switch Matrix for Antenna Selection
- Directs Tuning of Each Receiver
- Activates Each Recorder
- Notifies Operator When to Change Tapes in Recorders

RECORDING METHOD TRADEOFFS (1 OF 2)

ADVANTAGES	DISADVANTAGES
MANUALLY OPERATED CASSETTE RECORDERS:	
O SIMPLICITY OF OPERATION	O MORE WORK FOR BOARDMAN
O AMPLE STORAGE CAPACITY	O MANUAL DISSEMINATION REQ'D.
O SIMPLE TO CREATE REDUNDANCY	O INELEGANT ARCHIVE RETRIEVAL
O EASY TO MAINTAIN	
O INEXPENSIVE	
O SIMPLE TO DISSEMINATE	
O LOW RISK	
COMPUTER-CONTROLLED CASSETTE RECORDERS:	
O SIMILIAR TO ABOVE, BUT OFFERS MORE AUTOMATION	
ANALOG DISK STORAGE:	
O AUTOMATION OF COLLECTION AND DAILY STORAGE	O INHERENTLY SINGLE USER DEVICE
O MANAGEMENT OF COLLECTIONS	O LIMITED PLAYBACK CONTROL
O PERMITS ELECTRONIC BROADCAST DISSEMINATION TO MONITORS	O EXPENSIVE
	O SOME LIMITS TO STORAGE CAPACITY

RECORDING METHOD TRADEOFFS (2 OF 2)

	ADVANTAGES	DISADVANTAGES
DISK STORAGE OF DIGITIZED AUDIO:		
	O PROVIDES TOTAL MANAGEMENT OF COLLECTED BROADCASTS O PROVIDES TOTAL AUTOMATION OF BROADCAST COLLECTION O HANDLES SIMULTANEOUS USERS O PERMITS ELECTRONIC BROADCAST DISSEMINATION TO MONITORS	O NOT SIMPLE TO MAINTAIN O EXPENSIVE; REQUIRES REDUNDANCY O MORE COMPLICATED TO OPERATE O DISSEMINATION SCHEME LIMITS CONTROL OVER MONITOR'S PLAYBACK O DIGITIZED DATA IS VOLUMINOUS O NECESSITATES A TAPE BACKUP O DIFFICULT TO ACCOMODATE OPEN SPEAKER WATCH
OPTICAL DISK STORAGE:		
	O PERMITS COLLECTION AUTOMATION O ALLOWS ELECTRONIC DISSEMINATION	O INHERENTLY SINGLE USER O SOME TECHNOLOGY RISKS O NON-ERASABLE MEDIA



- O BOARDMAN FILE SET-UP
  - USES THE BUREAU COVERAGE SCHEDULE AS COLLECTION BASIS [PREPARED BY M.O.D., PERHAPS MODIFIED BY BUREAU CHIEF]
  - CONTROLLED BY THE MONITORING ASSIGNMENT SCHEDULES [PREPARED BY DEPUTY BUREAU CHIEF, PERHAPS MODIFIED BY MONITOR SECTION SUPERVISOR]

- O COLLECTION OPERATION
  - COMPUTER SORTS THE HF COVERAGE SCHEDULE BY START TIMES
  - IF MONITORED LIVE, COMPUTER MATCHES EACH BROADCAST AGAINST LIST OF OPERATOR ASSIGNMENTS
  - COMPUTER SELECTS RECEIVER AND ASSOCIATED RECORDER
  - OPERATOR IS REQUESTED TO LOAD AND READY RECORDER
  - OPERATOR ENTERS TAPE NUMBER INTO SYSTEM
  - COMPUTER TUNES RECEIVER
  - COMPUTER STARTS RECORDER PRIOR TO BROADCAST
  - COMPUTER STOPS RECORDER AFTER THE SCHEDULED END OF BROADCAST
  - OPERATOR IS NOTIFIED THAT BROADCAST HAS BEEN COLLECTED
  - OPERATOR DISSEMINATES TAPE TO MONITOR

- O OPEN SPEAKER WATCH
  - OPERATOR NOTIFIES COMPUTER OF NEED FOR CONTINUOUS MONITORING
  - COMPUTER DEDICATES A RECEIVER AND RECORDER TO OPEN WATCH
  - COMPUTER NOTIFIES OPERATOR OF NEED TO CHANGE TAPES BEFORE TAPE RUNS OUT
  - MONITOR CAN REQUEST A TAPE CHANGE AT ANY TIME IN ORDER TO PERFORM A TRANSLATION

- O SET-UP OF COVERAGE SCHEDULE IS AUTOMATIC FROM SOFTCOPY VERSION
- O MODIFY COVERAGE SCHEDULE
  - ALLOWS ADDING TO COVERAGE SCHEDULE DURING CRISIS
  - CAN ADD STATIONS UNDERGOING CRUISER'S EVALUATION
  - PERMITS SKIPPING PARTICULAR BROADCASTS IN SCHEDULE
  - ALLOWS DUPLICATE COLLECTIONS
- O SET-UP OF MONITORS' ASSIGNMENT SCHEDULES CAN BE MADE AUTOMATIC
- O MODIFY ASSIGNMENT SCHEDULES
  - PERMITS CHANGING PLANNED SCHEDULES DURING A CRISIS
  - ALLOWS DAILY MODIFICATIONS TO MONITORING ASSIGNMENTS TO COMPENSATE FOR SICKNESS OR LATENESS
- O CONFIGURE EQUIPMENT
  - ALTERS DESCRIPTION OF EQUIPMENT TO COMPUTER
  - ALLOWS IDENTIFICATION OF EQUIPMENT UNAVAILABILITY DUE TO MAINTENANCE
- O COLLECTION INTERACTION
  - SHOWS STATUS OF ALL EQUIPMENT (IN USE OR AVAILABLE)
  - PERMITS OPERATOR TO HANDLE PROBLEMS (E.G., TAPE JAM)
- O MAINTENANCE SOFTWARE WILL SUPPORT THE DIAGNOSING AND SERVICING OF EQUIPMENT

- PURPOSE
  - AID THE TV CRUISER TO MANAGE THE COLLECTION OF INFORMATION DESCRIBING TELEVISION BROADCASTS
  - LOG INFORMATION GATHERED DURING CRUISING INTO A COMPUTER DATA BASE
  - SUPPLY BUREAU CRUISING LOGS TO HEADQUARTERS TO SUPPORT M.O.D. COVERAGE SCHEDULING
- IMPLEMENTATION
  - MODIFY ANTENNA SWITCHING TO BE COMPATIBLE WITH OTHER COLLECTION SUBSYSTEMS
  - USE EXISTING TV CRUISING EQUIPMENT FOR THE TV CRUISING FUNCTION
  - SUPPLY THE CRUISER WITH A PC WORKSTATION AND OFFICE AUTOMATION SOFTWARE
  - BUILD AND MAINTAIN A TV CRUISING LOG IN SOFTCOPY
  - SUPPLY CRUISING LOGS TO M.O.D. VIA THE PROCESSING AND COMMUNICATIONS SEGMENTS TO HEADQUARTERS

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FBIS–TV CRUISING SUBSYSTEM BLOCK DIAGRAM

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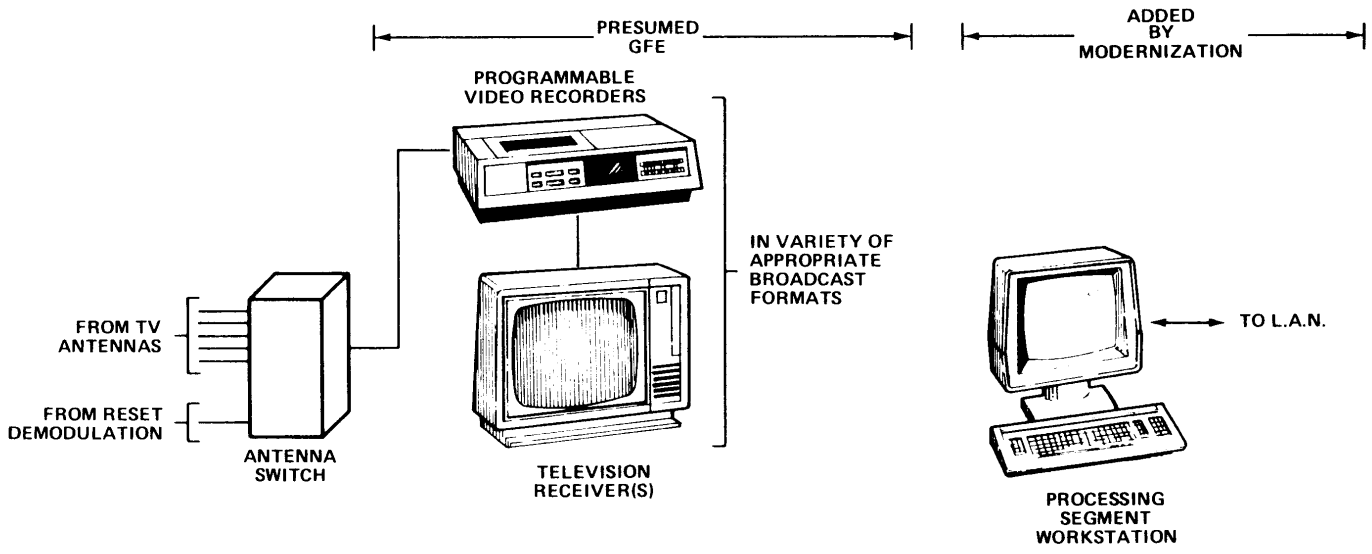

- CRUISING EQUIPMENT WILL BE CO-LOCATED WITH CRUISER'S TERMINAL TO FORM TO CRUISER'S OPERATOR POSITION

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USE OF TV CRUISING TERMINAL

- Permits TV Cruiser to Maintain a TV Cruising Log in Softcopy
- Log File Will be Similiar to Radio Log File, but not Automatically Filled in
- Will Permit Keeping Records for More than One Station Broadcasting on the Same Channel [Remote Reception]
- For Each Station, Data Will be Kept for Prefered Antenna and Antenna Pointing Direction
- An Observed TV Broadcast Schedule Will be Maintained Similiar to that for Radio Broadcasts
- Cruiser Can Include Comments in the Log File to Note Broadcast Quality and Usefulness of News Broadcasts

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- Purpose
  - Collection of Television Broadcasts
  - Logging of Collection Information into a Computer Data Base
- Implementation
  - Modify Antenna Switching to be Compatible with Other Collection Subsystems
  - Use Existing TV Collection Equipment for the TV Collection Function
  - Augment the Collection Equipment with a PC Workstation and Office Automation Software
  - Build and Maintain a TV Collection Log in Softcopy

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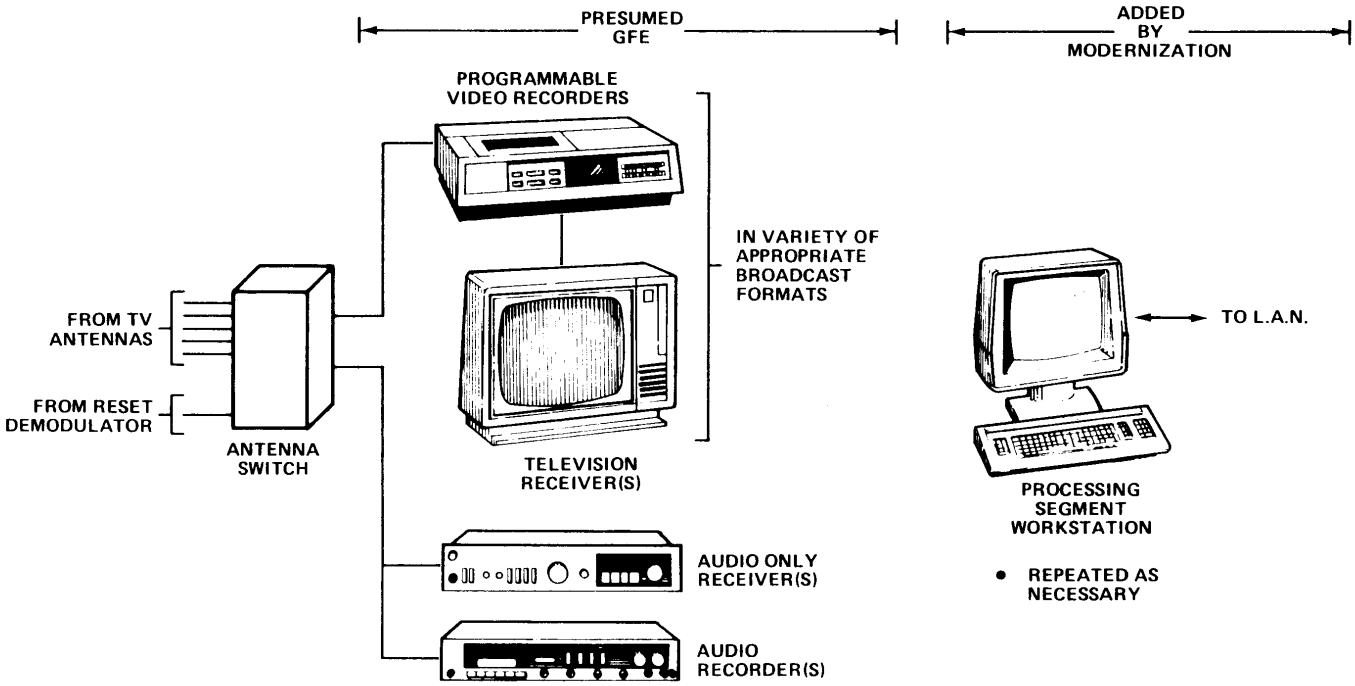
FBIS–TV COLLECTION SUBSYSTEM BLOCK DIAGRAM

TRW



- COLLECTION EQUIPMENT TO BE CO-LOCATED WITH MONITORS' WORKSTATION
- EQUIPMENT REPLICATED AS NECESSARY TO HANDLE COLLECTION LOAD

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- Operation is Similiar to Radio Collection, Except that Equipment is not Computer Controlled
  - TV is Manually Tuned
  - Recorder is Manually Started and Stopped
- Operator is Afforded Same Facilities as in Radio Collection to Modify Coverage Schedule and Adjust Monitoring Assignments
- Software is Used to Create and Maintain a TV Collection Log Data Base

---

- O PC WORKSTATIONS
  - IMPLEMENTED ON A SINGLE-USER MICROCOMPUTER SUCH AS IBM PC
  - COMMON TYPE OF EQUIPMENT SERVES MANY FUNCTIONS:
    - o EDITING
    - o MONITORING (RADIO, TV, PUBLICATIONS, AND SOME PRESS WIRES)
    - o ADMINISTRATION
    - o TECHNICAL SUPPORT
    - o TV CRUISING AND COLLECTION
- O MULTI-LINGUAL WORKSTATIONS
  - IMPLEMENTED WITH AN INTELLIGENT WORKSTATION SUCH AS XEROX 8010
  - SERVES MONITORING FUNCTION ON FOREIGN LANGUAGE PRESS WIRES
  - MAINTAINS SOME FOREIGN LANGUAGE GLOSSARIES
  - ALSO USED FOR REVERSE TRANSLATION
- O SPECIAL-PURPOSE WORKSTATIONS
  - IMPLEMENTED WITH A WORKSTATION (LIKE IBM PC)
  - USED TO CONTROL ALL SPECIAL DEVICES: COMM LINES, PRESS WIRES, TAPE DRIVES
- O PRINTERS
  - USED FOR ADMIN WORD PROCESSING OUTPUT
  - ALSO AVAILABLE TO PRINT HARDCOPIES OF BUREAU ITEMS OR COMMUNICATIONS TRAFFIC
- O LAN BUS
  - BASED ON COMMERCIALLY AVAILABLE LAN TECHNOLOGY
  - USED TO CONNECT TERMINALS AND DEVICES TO PERMIT COMMUNICATIONS

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FBIS–PROCESSING SEGMENT BLOCK DIAGRAM

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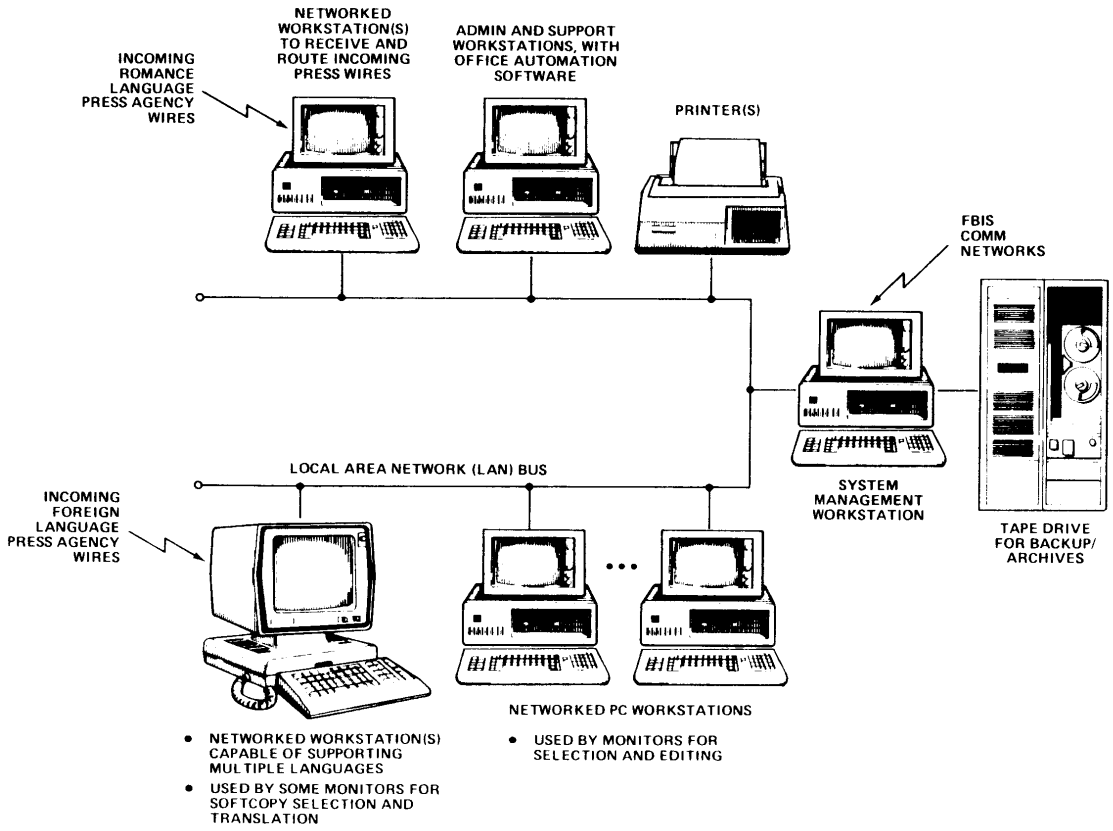

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ALL MULTI-LINGUAL TERMINALS	VS.	TWO TERMINAL TYPES
- LESS COMMERCIAL INTEREST		+ OFFICE AUTOMATION SOFTWARE IS READILY AVAILABLE
- MORE COSTLY		+ USES LESS EXPENSIVE EQUIPMENT
- LIMITED VENDOR SUPPORT INCREASES OTHER INTEGRATION		+ MORE COMMON EQUIPMENT IS MORE UNIVERSALLY ACCEPTED
- FEW VENDORS TO CHOOSE FROM		+ PERMITS MORE COMPETITIVE PROCUREMENT
+ MINIMIZES RISK		- REQUIRES VENDOR INTEGRATION
+ SIMPLIFIES TRAINING		- MORE TRAINING REQUIRED
+ SIMPLIFIES MAINTENANCE		- MORE SPARES REQUIRED

- Press Collection
  - Special PC Workstations are Configured to Receive and Store English and Romance Language Press Agency Wires
  - Transliteration May be Done to Re-code Diacritics
  - Foreign Languages in Other Alphabets are Received and Stored by Multi-Lingual Workstations
  - Logs are Kept of all Received Items
- Publication Collection
  - Administration Sets up a Data Base of Subscriptions
  - A PC Workstation is Used to Record the Daily Receipt of Each Subscription

---

O RADIO AND TV MONITORING

- RECORDED TAPES ARE DELIVERED TO THE ASSIGNED MONITOR
- MONITOR LISTENS TO TAPE USING DICTAPHONE-LIKE RECORDER
- MONITOR USES PC WORKSTATION TO CREATE PROGRAM SUMMARIES AND FILES OF TRANSLATED TEXT

O PRESS AGENCY WIRE MONITORING

- FOREIGN-LANGUAGE TRANSMISSION:
  - o MONITOR SCANS ITEMS AT MULTI-LINGUAL TERMINAL
  - o MONITOR CREATES PRESS SUMMARIES AND TRANSLATED TEXT AT MULTI-LINGUAL TERMINAL
- ROMANCE-LANGUAGE TRANSMISSION:
  - o MONITOR CAN WORK AT RECEIVING WORKSTATION OR A PC WORKSTATION
  - o MONITOR SCANS ITEMS AT RECEIVING WORKSTATION
  - o PRESS SUMMARIES ARE PREPARED AT RECEIVING WORKSTATION
  - o MONITOR PREPARES TRANSLATIONS AT RECEIVING WORKSTATION, OR AT 'HOME' WORKSTATION
- PRINTER CAN BE USED TO PRINT HARDCOPIES OF WIRES

O PUBLICATION MONITORING

- SUBSCRIPTIONS ARE DELIVERED TO MONITORS AT WORKSTATIONS
- PUBLICATION SUMMARIES AND TRANSLATIONS ARE PREPARED AT PC WORKSTATIONS

O EDITING AND TRAINING

- EDITORS RECEIVED TRANSLATED ITEMS AS TEXT FILES AT THEIR PC WORKSTATIONS
- EDITING IS DONE IN SOFTCOPY, RETAINING EDIT CHANGES
- PRINTER CAN BE USED TO PRINT HARDCOPIES OF ANY TRANSLATED AND/OR EDITED ITEM

- Message Processing
  - Editor Codes List of Receipients
  - Message Processing Software Formats the Text for Transmission
  - Message Processing Software Expands Coded List into Transmission List
  - The Workstation Transmits the Message to Headquarters
  - Transmitted Messages are Recorded to Tape Archive
  - Transmitted Items are Stored Online, Purged by System Manager on a Regular Schedule
- Administration & Technical Support
  - Bureau Chief, Deputy Chief, Administrative Assistants, Technicians all use PC Workstations
  - Off-the-Shelf Commercial Office Automation Software for PCs Provide Word Processing and Data Base Management

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BUREAU BLOCK DIAGRAM

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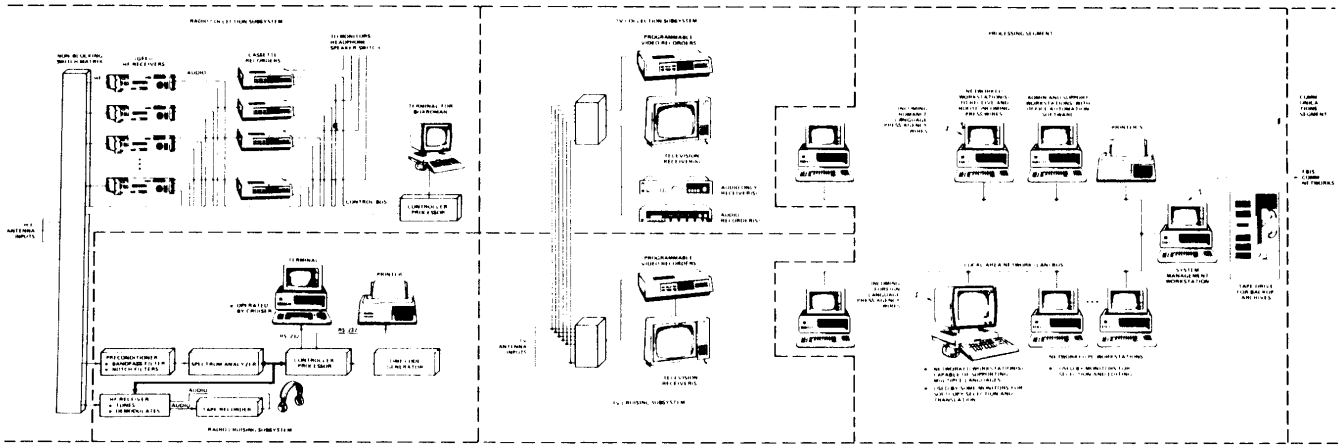

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- COMMUNICATIONS SEGMENT IS COMPOSED ALMOST ENTIRELY OF GOVERNMENT FURNISHED FACILITIES

- MESSAGE PROCESSING SUBSYSTEM SOFTWARE RESIDES ON A 'SPECIAL PC WORKSTATION' IN THE PROCESSING SEGMENT

- LAN Integration of Multi-Lingual Workstation
  - (Probable) Different Vendors for Workstations Imposes Some Risk of Complete Integration
  - Possible to Provide Work-Around by Making Multi-Lingual Workstations Stand-Alone (Use a Hard Media Interface Instead of Electronic)
- Use of PCs to Interface to Wire Services and Comm
  - Depends on Vendor Whether Hardware Support is Available
  - May be Difficult to Add Software to the Chosen PC
  - Possible to Work-Around by Using a Minicomputer Instead
- Suitability of Existing Government Equipment Where a GFE Assumption was Made
- Degree to Which All Features of Various Commercial Software Packages Can be Integrated in a Network

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- Collection Segment
  - The HF Switch Matrix Needs to have a Backup or Work-Around
  - Collection Subsystems Need Control Redundancy
  - Need a Patch Panel to Switch Different Receivers to Monitors
  - Need to Allow Open Speaker Watch Concurrent with Normal Monitoring
  - Tradeoffs on Time Stamping of Recordings Need to be Completed
- Processing Segment
  - More Redundancy is Needed to Support Wire Services & Comm
  - Monitor's Work Area Needs more Detail [Number of Inputs, etc.]
  - How to Utilize Time Code Recorded on Tape Recordings

2.2.1.1.2.1 AUTOMATIC DISTRIBUTION OF A BROADCAST OCCURS ONLY DURING TRANSMISSION; SUBSEQUENT ACCESS TO THE RECORDED BROADCAST IS BY RECEIPT OF CASSETTE TAPE. [UNCLEAR SPEC LANGUAGE]

2.2.1.1.2.3 MANUAL TUNING IS POSSIBLE BY PHONING THE BOARDMAN; IS NOT CONTROLLABLE BY MONITOR. [UNCLEAR SPEC LANGUAGE] ANTENNA SELECTION IS NOT UNDER DIRECT CONTROL OF THE MONITOR. [UNCLEAR SPEC LANGUAGE]

2.2.1.2.3 HELLSCHREIBER AND FAX WILL BE RECORDED ON HARDCOPY

2.2.1.3.2 TV RECEPTION IS NOT AS FULLY AUTOMATED AS RADIO

2.2.1.4.2.2 ALERTS OF PUBLICATION LATENESS & NEED TO RENEW SUBSCRIPTIONS ARE BY VISUAL CHECKS

2.2.2.1.3.3 ANTENNA POINTING CANNOT BE AUTOMATICALLY ENTERED UNLESS ROTATORS HAVE A DIGITAL READOUT

2.3.2.1 WILL HANDLE BY OPERATIONAL MEANS 'QUASI-REAL-TIME' VIEWING OF A FILE AT OTHER TERMINALS

5. HEADQUARTERS DESIGN

HEADQUARTERS BRIEFING AGENDA

- REQUIREMENTS
  - -Assumptions
  - -Driving Requirements
- HEADQUARTERS DESIGN INTRODUCTION
  - - Key Headquarter Functions
- HEADQUARTERS DESIGN APPROACH
  - - Design Process
  - - Design Assumptions
  - - Segmentation
  - - Design Alternatives
  - - Functional Allocation
  - - Functional Data Flows
  - - Sizing
- HEADQUARTERS DESIGN
  - - Block Diagram
- DESIGN EVALUATION
- ISSUES
- RISKS
- SUMMARY

HEADQUARTER REQUIREMENTS

=====> - ASSUMPTIONS
- DRIVING REQUIREMENTS

- O SEC 1.4.1 [...NATURE OF FILES...] IDENTIFIES LARGE TEXT FILES WITH EMBEDDED GRAPHICS
  - INTERPRETED AS REQUIRING THE STORAGE AND MANIPULATION OF GRPAHIC FILES
- O SEC 1.7.4.4 [SUPPORT FOR THE INTEGRATION OF TEXT AND GRAPHICS] THIS REQUIREMENT WAS STATED UNDER "EDITING TOOLS"
  - INTERPRETED AS REQUIRING THE DISPLAY AND MANIPULATION OF MERGED GRAPHICS ON THE SAME SCREEN, BUT ONLY AT SELECTED TERMINALS
  - COMPOSE REPORTS WITH MIXED TEXT AND GRAPHICS

HEADQUARTER REQUIREMENTS
- ASSUMPTIONS
=====> - DRIVING REQUIREMENTS

- O SECURITY
- O INTEGRATED TEXT AND GRAPHICS
- O MULTILINGUAL TEXT PROCESSING
- O DATA BASE
  - DISCUSSED IN HEADQUARTERS DATA BASE DESIGN BRIEFING

INTE ACT

REQUIREMENTS (SDS-002A)

- O [Sec 1.4] Data Base Management
  - Text Files with embedded graphics
- O [Sec 1.7] Text Processing
  - Support for integration of text and graphics
- O [Sec 1.8] Composition Requirements
  - Potential support for input, manipulation, and output of line art and halftone graphics
  - Might include what-you-see-is-what-you-get composition device

DESIGN IMPACT

- O ARCHIVAL DATA BASE STORAGE OF GRAPHICS
- O COMPOSITION WORKSTATION WITH TEXT/GRAPHICS CAPABILITIES
- O DIGITIZER WORKSTATION

SECURITY REQUIREMENT DESIGN IMPACT

REQUIREMENTS (SDS-002A)

- [Sec 4.0] SECURITY
  - Classified Environment
    - AG and PROD (%) analyst
    - All classified material
    - Tempest approved or shielded equipment
    - One-way unsecured input link
  - Unclassified Environment
    - FBIS Wire Service
    - Field bureau traffic
    - JPRS

DESIGN IMPACT

- THREE SEPARATE COMPUTER SYSTEMS
  - CLASSIFIED SYSTEM
    - PROD and AG Analyst Terminals
    - Archival Data Base
    - One-way input link from unclassified systems
    - Declassified hardcopy output
  - WIRE SERVICE/DAILY REPORT SYSTEM (U)
    - Local Data Base
    - Wire Service and Daily Report Editors
    - PROD (%) analysts
  - JPRS System (U)
    - Remote (design assumption)
    - Local Data Base
    - JPRS Editors and Desk Officers
- AWKWARD INTERFACES AND DATA HANDLING
  - CSO Cards
  - Glossary Maintenance

REQUIREMENTS (SDS-002A)

- [Sec 1.1] General Requirements
  - Simultaneous manipulation and display of English and foreign langualge text
- [Sec 1.4] Data Base Management
  - Data value types include;...text representation (i.e. English only, Chinese, Chinese and English, etc.)
- [Sec 1.7] Text Processing, Editing tools
  - the creation and use of on-line dictionaries, glossaries and references: (Note: The foreign language text should be handled in the vernacular representation)

DESIGN IMPACT

- ARCHIVAL DATA BASE STORAGE OF FOREIGN LANGUAGE TEXT
- MULTILINGUAL WORKSTATIONS

HEADQUARTERS OVERVIEW

KEY HEADQUARTERS FUNCTIONS

WIRE SERVICE

- O EDIT/MONITOR FIELD TRAFFIC
- O SELECT/DISSEMINATE FIELD TRAFFIC TO WIRE SERVICE CUSTOMERS & FBIS
- O RECEIVE/TRANSMIT MESSAGES

DAILY REPORT

- O SELECT, EDIT & COMPOSE FIELD TRAFFIC INTO 8 DAILY REPORTS

PRODUCTION (AREA DIVISIONS)

- O PLAN SOURCE ACQUISITION
- O REVIEW/SCAN FOREIGN PUBLICATIONS AND DAILY REPORT OVERFLOW
- O SELECT ITEMS FOR TRANSLATION
- O PRODUCE TRANSLATION REFERENCE AIDS AND GLOSSARIES
- O PROVIDE LINGUISTIC SUPPORT

KEY HEADQUARTERS FUNCTIONS (CONTINUED)

JPRS

O MANAGE IC TRANSLATORS
O RECEIVE, EDIT AND COMPOSE TRANSLATIONS INTO SERIAL REPORTS
O PRODUCE IC NEWSLETTER

ANALYST GROUP

O ANALYZE BROADCAST AND PRINT MEDIA OF FOREIGN COUNTRIES
O PRODUCE, EDIT AND COMPOSE WEEKLY AND PERIODIC PUBLICATIONS
O CREATE AND MAINTAIN RESEARCH FILES

LRB

O PROCESS REQUESTS FOR INFORMATION
O PREPARE AND ISSUE LATERAL SERVICE LIST
O EVALUATE FBIS PRODUCTS

REFERENCE SERVICE

O DISTRIBUTE CLASSIFIED CABLE
O ACQUIRE REFERENCE MATERIAL
O COMPILE DIPLOMATIC AND CABINET LISTS

MOD

O SUPPORT FIELD BUREAU COLLECTION ACTIVITY
O PREPARE FIELD COVERAGE SCHEDULE

HEADQUARTERS DESIGN APPROACH

=====> - DESIGN PROCESS
- DESIGN ASSUMPTIONS
- SEGMENTATION
- ARCHITECTURE ALTERNATIVES
- FUNCTIONAL ALLOCATION
- FUNCTIONAL DATA FLOWS
- SIZING

- REQUIREMENT INTERPRETATION
- DESIGN ASSUMPTIONS
- FUNCTIONAL ALLOCATION
- FUNCTIONAL DESIGN
- FUNCTIONAL DATA FLOWS
- IMPLEMENTATION ALTERNATIVES
- SIZING
- DESIGN BLOCK DIAGRAM

HEADQUARTERS DESIGN APPROACH

- DESIGN PROCESS
=====> - DESIGN ASSUMPTIONS
- SEGMENTATION
- ARCHITECTURE ALTERNATIVES
- FUNCTIONAL ALLOCATION
- FUNCTIONAL DATA FLOWS
- SIZING

- O JPRS REMOTE

- O "TRUSTED HARDWARE" NOT ACCEPTABLE FOR SANITIZING CLASSIFIED DATA
  - OLD TECHNOLOGY
  - SLOW TRANSFER
  - HIGH RISK OF ACCEPTANCE
  - DOES NOT SATISFY SDS-002A

- O MAJOR SUBSYSTEMS OFF-THE-SHELF
  - EDITORIAL
  - COMPOSITION
  - MULTILINGUAL TEXT PROCESSING (?)

HEADQUARTERS DESIGN APPROACH

- DESIGN PROCESS
- DESIGN ASSUMPTIONS

====> - SEGMENTATION

- ARCHITECTURE ALTERNATIVES
- FUNCTIONAL ALLOCATION
- FUNCTIONAL DATA FLOWS
- SIZING

SEGMENTATION CRITERIA

- O LIKE FUNCTIONS GROUP TOGETHER
- O PROMOTE SIMPLE INTERFACES
- O SEGMENTS ALIGNED WITH AVAILABLE PRODUCTS
- O CAPTURE ALL REQUIREMENTS (SDS-002A)

HEADQUARTER SEGMENTS

1.0 EXTERNAL COMMUNICATION

2.0 EDITORIAL

3.0 MULTILINGUAL TEXT PROCESSING

4.0 COMPOSITION

5.0 DATA BASE SERVICES

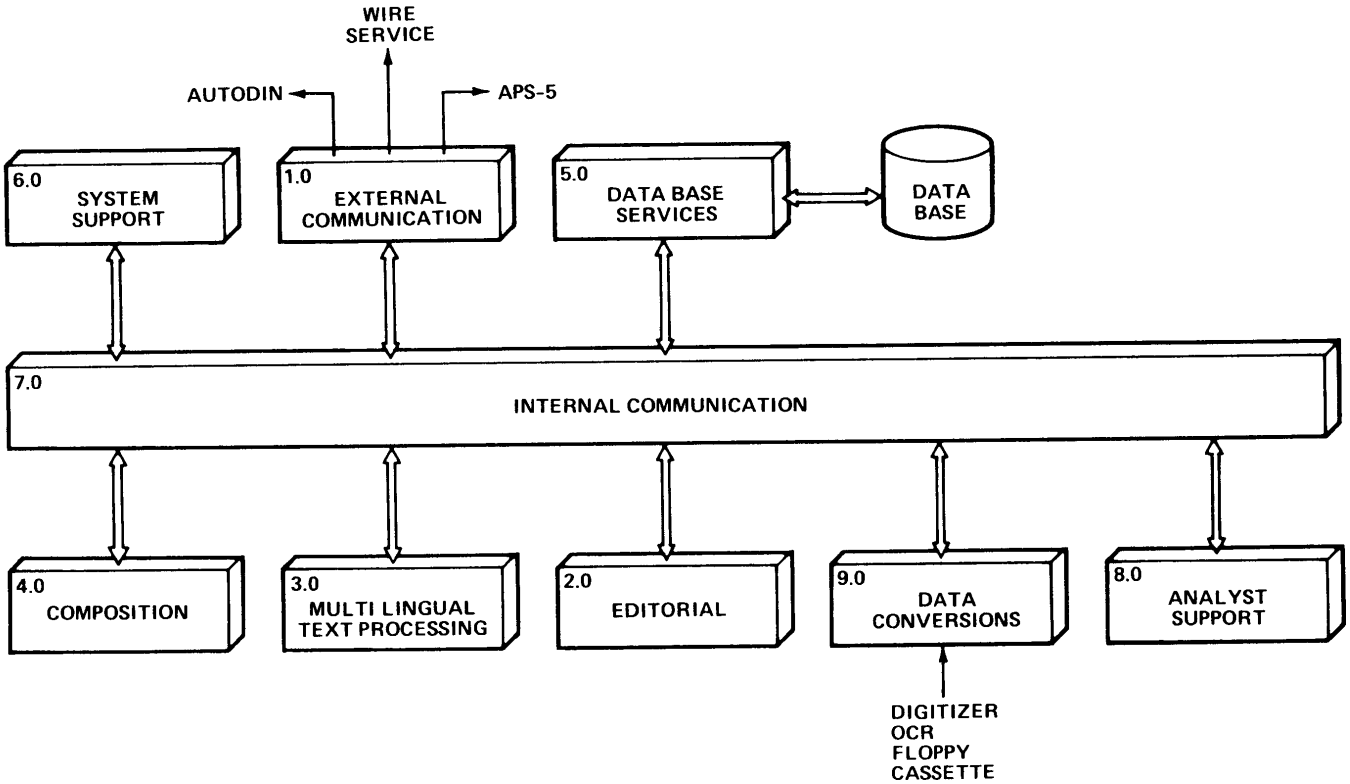
6.0 SYSTEM SUPPORT

7.0 INTERNAL COMMUNICATION

8.0 ANALYST SUPPORT

9.0 DATA CONVERSIONS

FBIS–GENERIC FUNCTIONAL STRUCTURE



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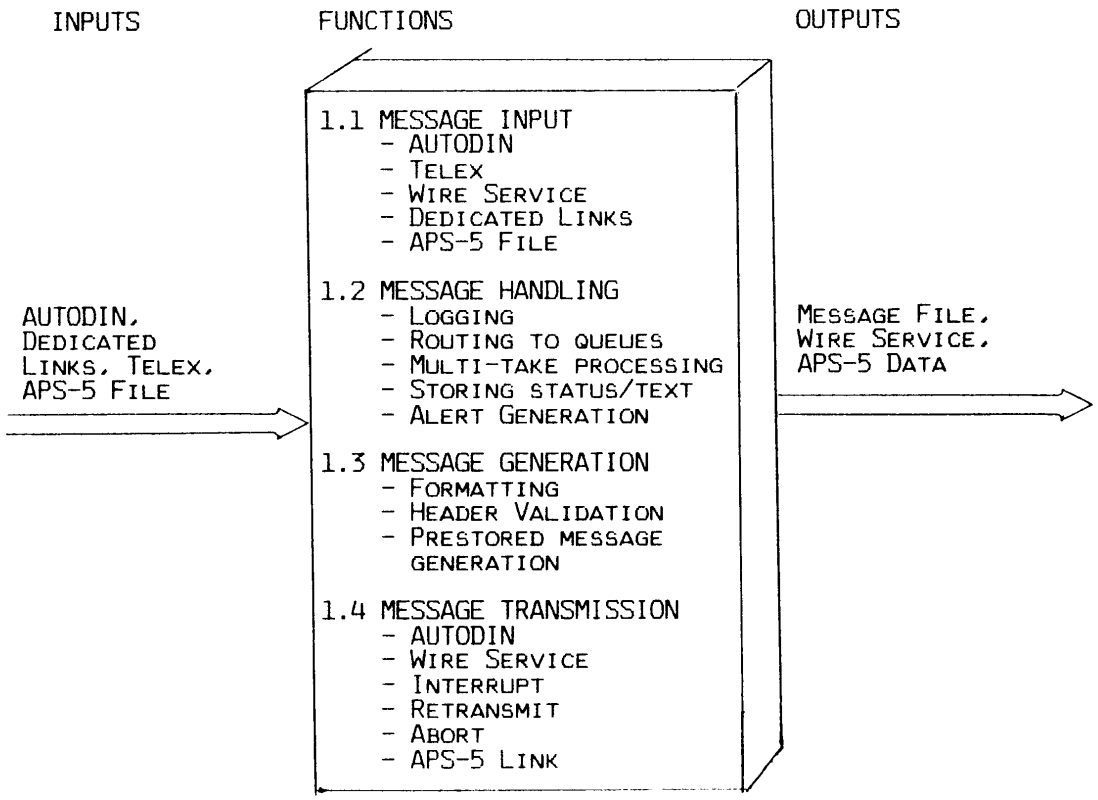
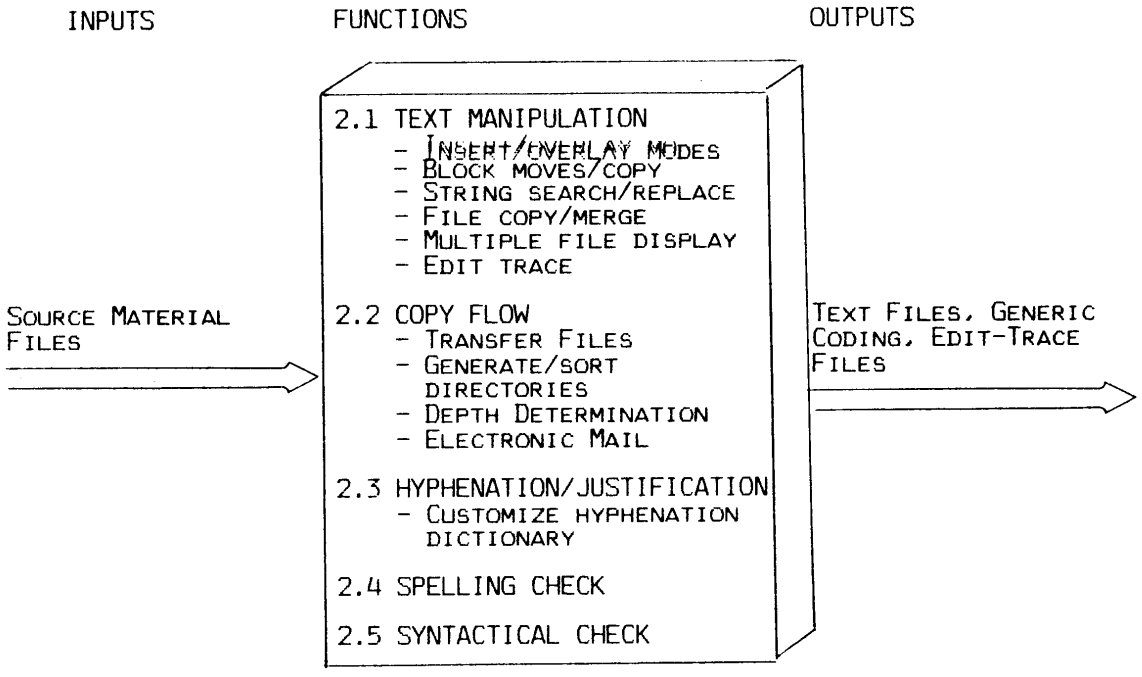
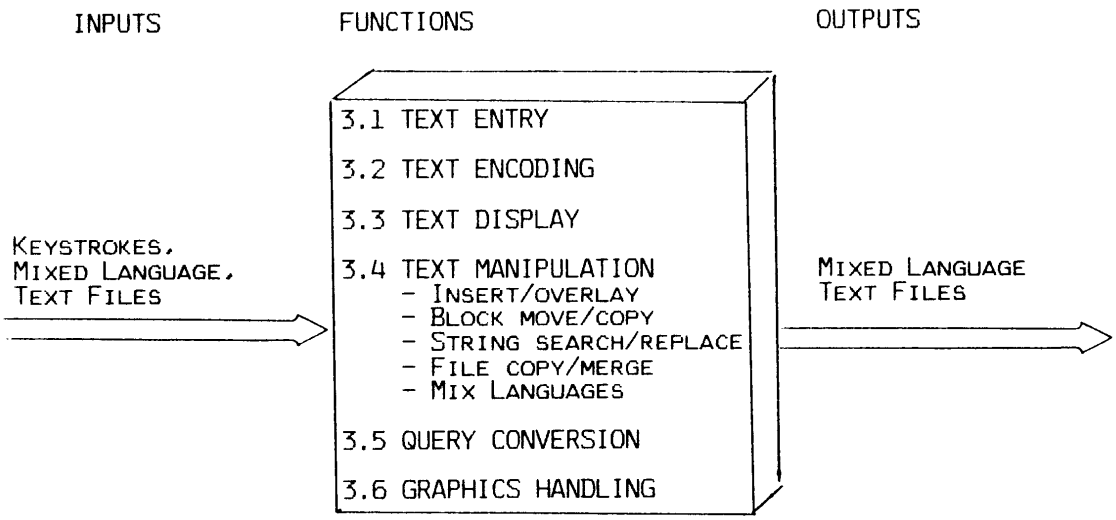
1.0 EXTERNAL COMMUNICATIONS



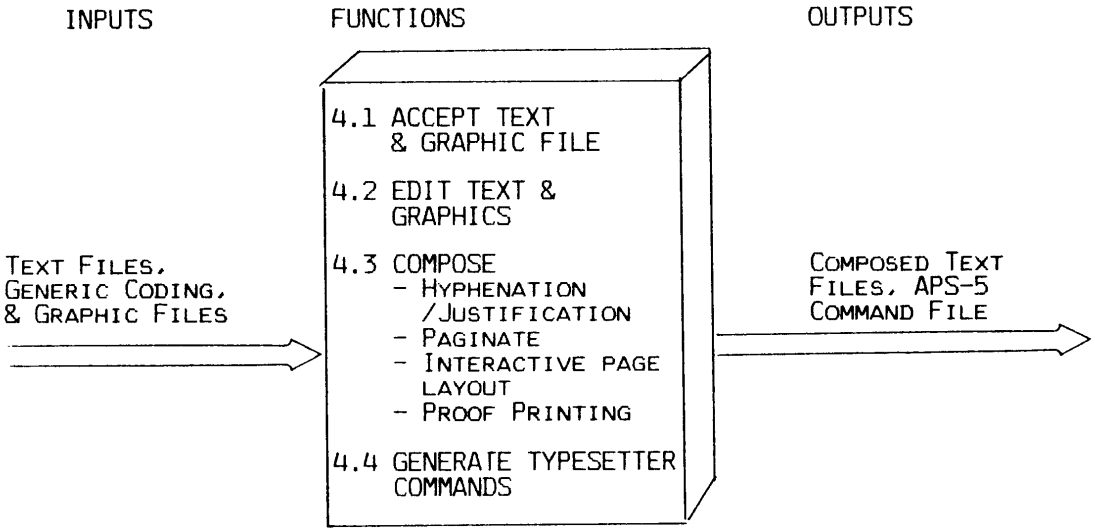
2.0 EDITORIAL SEGMENT



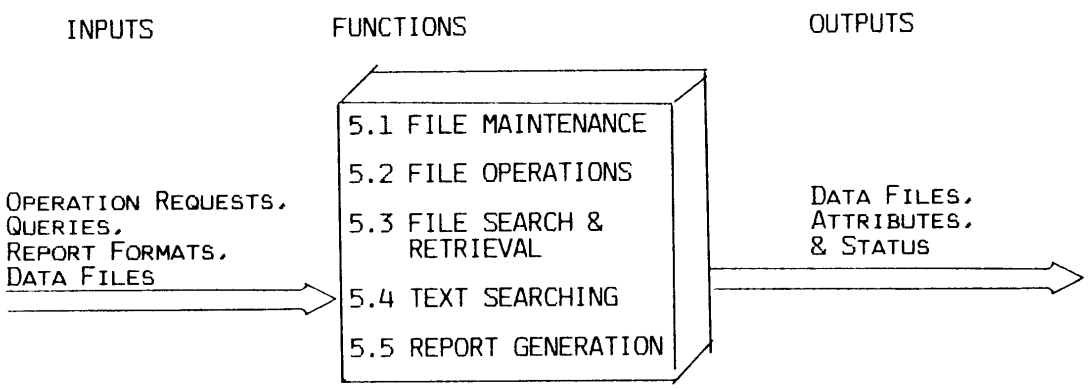
3.0 MULTILINGUAL TEXT PROCESSING



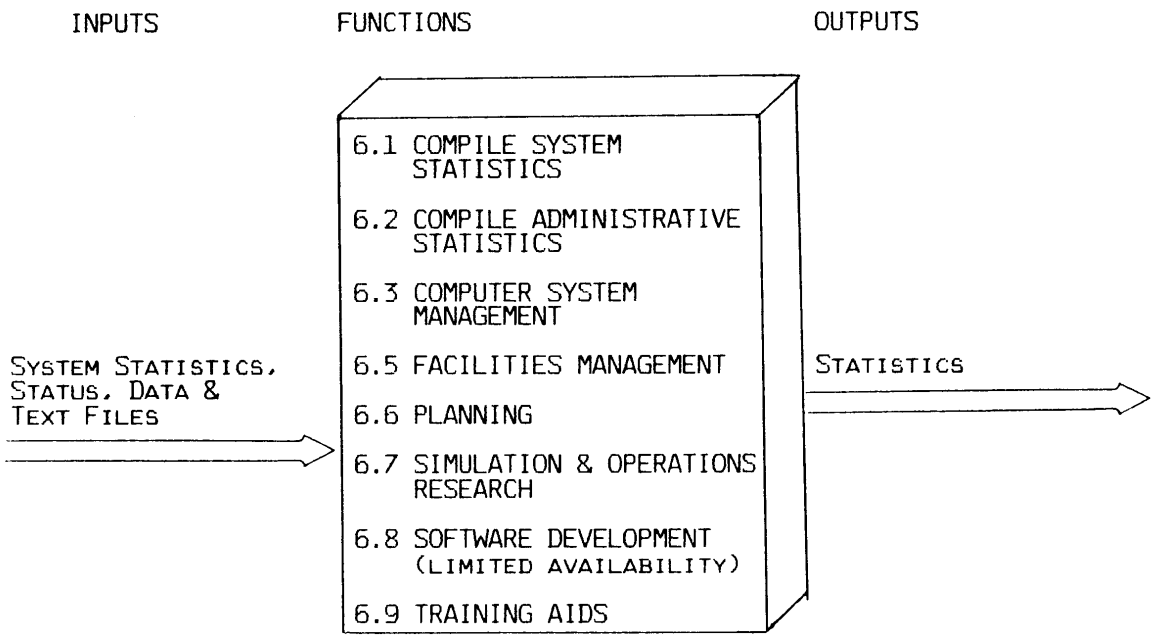
4.0 COMPOSITION SEGMENT



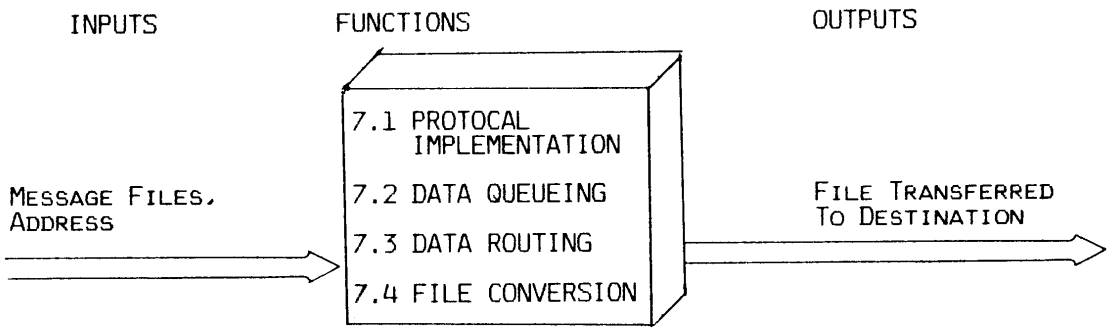
5.0 DATA BASE SERVICES



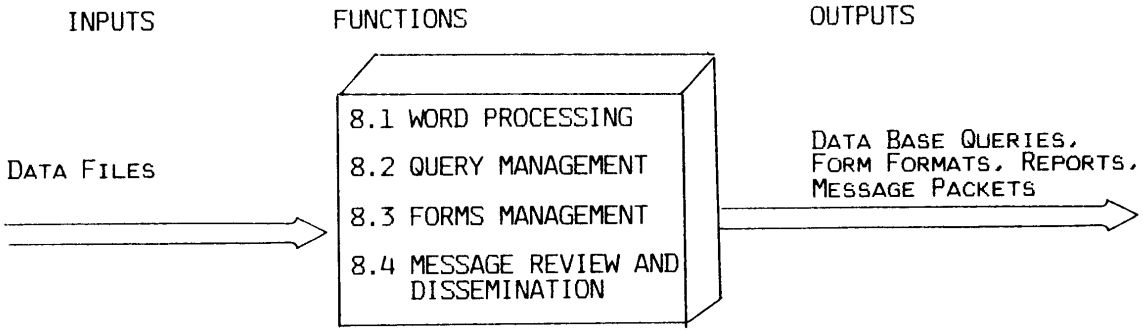
6.0 SYSTEM SUPPORT SEGMENT



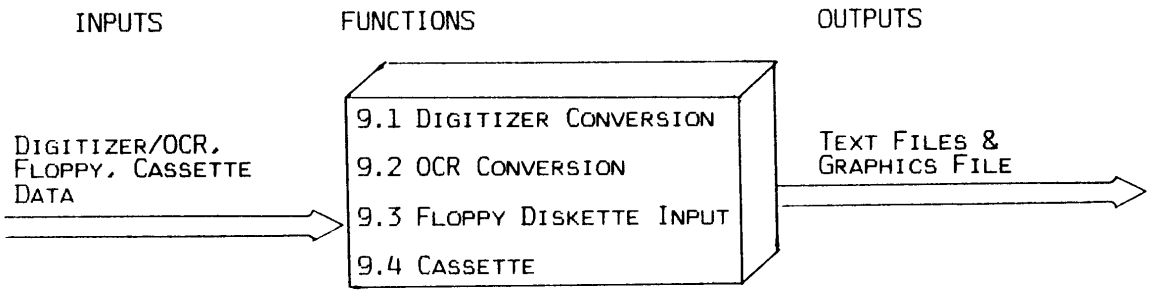
7.0 INTERNAL COMMUNICATION



8.0 ANALYST SUPPORT



9.0 DATA CONVERSION



HEADQUARTERS DESIGN APPROACH

- DESIGN PROCESS
- DESIGN ASSUMPTIONS
- SEGMENTATION
=====> - ARCHITECTURE ALTERNATIVES
- FUNCTIONAL ALLOCATION
- FUNCTIONAL DATA FLOWS
- SIZING

DESIGN ARCHITECTURE ALTERNATIVES

- MAIN FRAME
  - SINGLE CPU
  - CENTRALIZED DATA BASE
- CLUSTERED CPUs
  - MULTIPLE CPUs
  - COMMON HIGH SPEED DATA BUSES
  - REDUNDANT TERMINAL LINKS
  - REDUNDANT DATA BASE LINKS
  - ADD CPUs TO GAIN DESIRED RESPONSE
  - CENTRALIZED DATA BASE
- WORKSTATION NETWORK
  - ONE PERSON PER CPU
  - HIGH SPEED COMMUNICATION NETWORK
  - GOOD RESPONSE FOR INTERACTIVE APPLICATIONS
  - DISTRIBUTED DATA BASE

ARCHITECTURE EVALUATION CRITERIA

- OFF-THE-SHELF
  - EDITORIAL SYSTEM
- LARGE DATA BASE
- LARGE NUMBER ON-LINE USERS
- LOW TECHNICAL RISK
- GROWTH FOR NEW TECHNOLOGY

ARCHITECTURE EVALUATION

EVALUATION

- O MAINFRAME
  - LIMITED DATA BASE SIZE
  - POOR RESPONSE FOR LARGE NUMBER USERS
==> - NO ACCEPTABLE EDITORIAL OR COMPOSITION SOFTWARE

- O CLUSTERED CPUs
  - LIMITED DATA BASE SIZE
  - ADD CPUs TO IMPROVE RESPONSE FOR LARGE NUMBER USERS
  - ACCEPTABLE EDITORIAL SOFTWARE
  - NO ACCEPTABLE COMPOSITION OR MULTILINGUAL SOFTWARE

- O WORKSTATION NETWORK
==> - NO ACCEPTABLE EDITORIAL SYSTEM

CONCLUSION

- O CLUSTERED CPUs VIABLE ARCHITECTURE
  - ONLY ARCHITECTURE WITH ACCEPTABLE EDITORIAL SOFTWARE AVAILABLE

- O ATTACH WORKSTATION TO ACCOMPLISH COMPOSITION AND MULTILINGUAL FUNCTIONS

HEADQUARTERS DESIGN APPROACH

- DESIGN PROCESS
- DESIGN ASSUMPTIONS
- SEGMENTATION
- ARCHITECTURE ALTERNATIVES

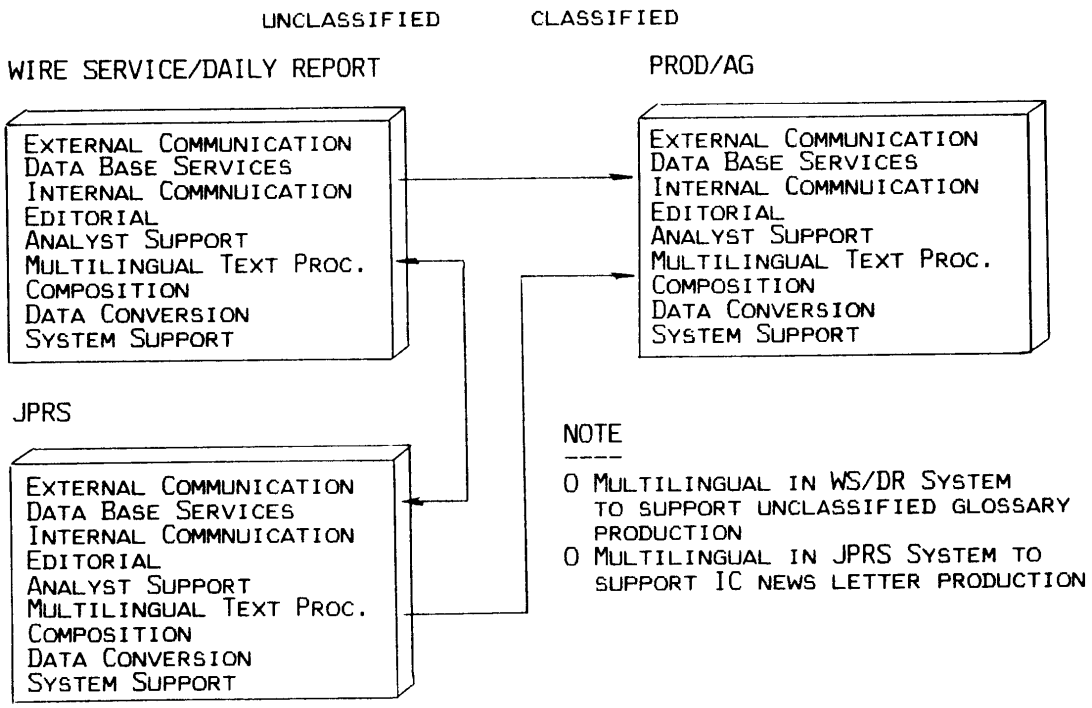
=====> - FUNCTIONAL ALLOCATION

- FUNCTIONAL DATA FLOWS
- SIZING

ALLOCATION CRITERIA

- O ALLOCATE SEGMENTS FOR THREE COMPUTER SYSTEMS
  - CLASSIFIED (PROD & AG)
  - WIRE/SERVICE & DAILY REPORT
  - JPRS
- O ALLOCATE SEGMENTS BASED ON FBIS OPERATIONAL FUNCTIONS ASSIGNED EACH SYSTEM
- O ALLOCATE SEGMENTS TO SUPPORT REQUIRED SEGMENT COMMUNICATIONS

SEGMENT ALLOCATION



HEADQUARTERS DESIGN APPROACH

- DESIGN PROCESS
- DESIGN ASSUMPTIONS
- SEGMENTATION
- ARCHITECTURE ALTERNATIVES
- FUNCTIONAL ALLOCATION

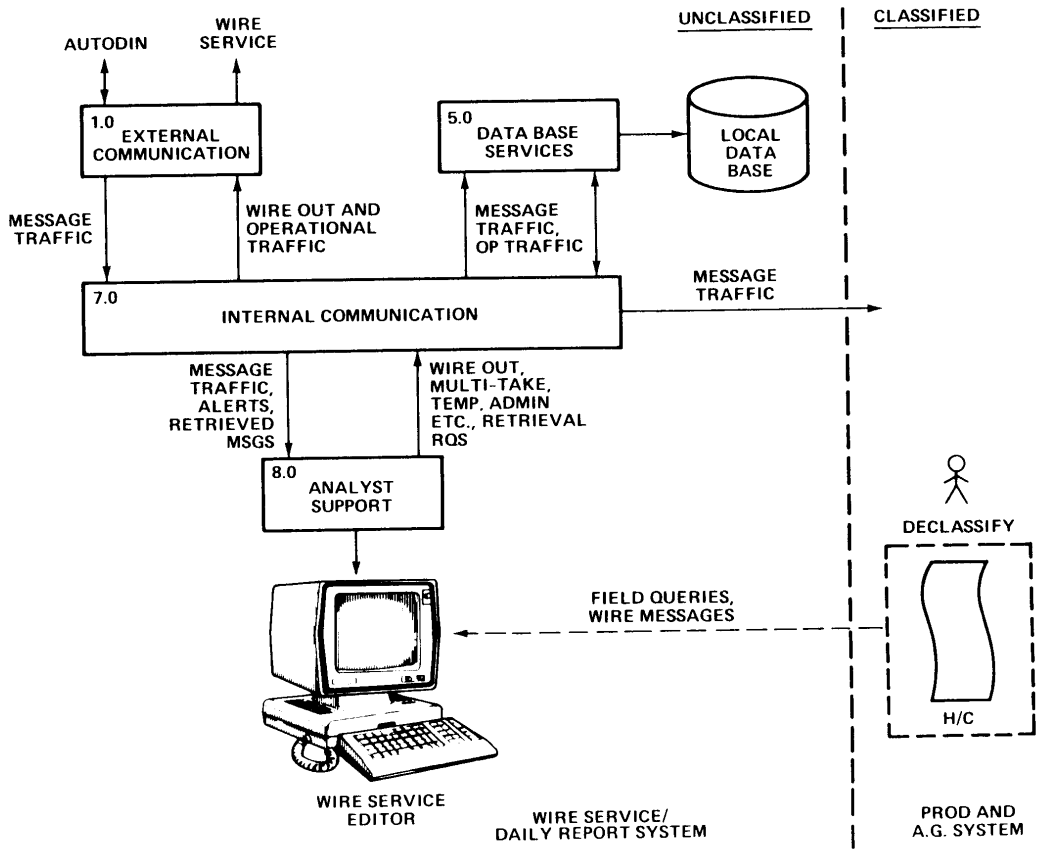
=====> - FUNCTIONAL DATA FLOWS

- SIZING

ESL
A Subsidiary of TRW

FBIS–WIRE SERVICE DATA FLOW

TRW



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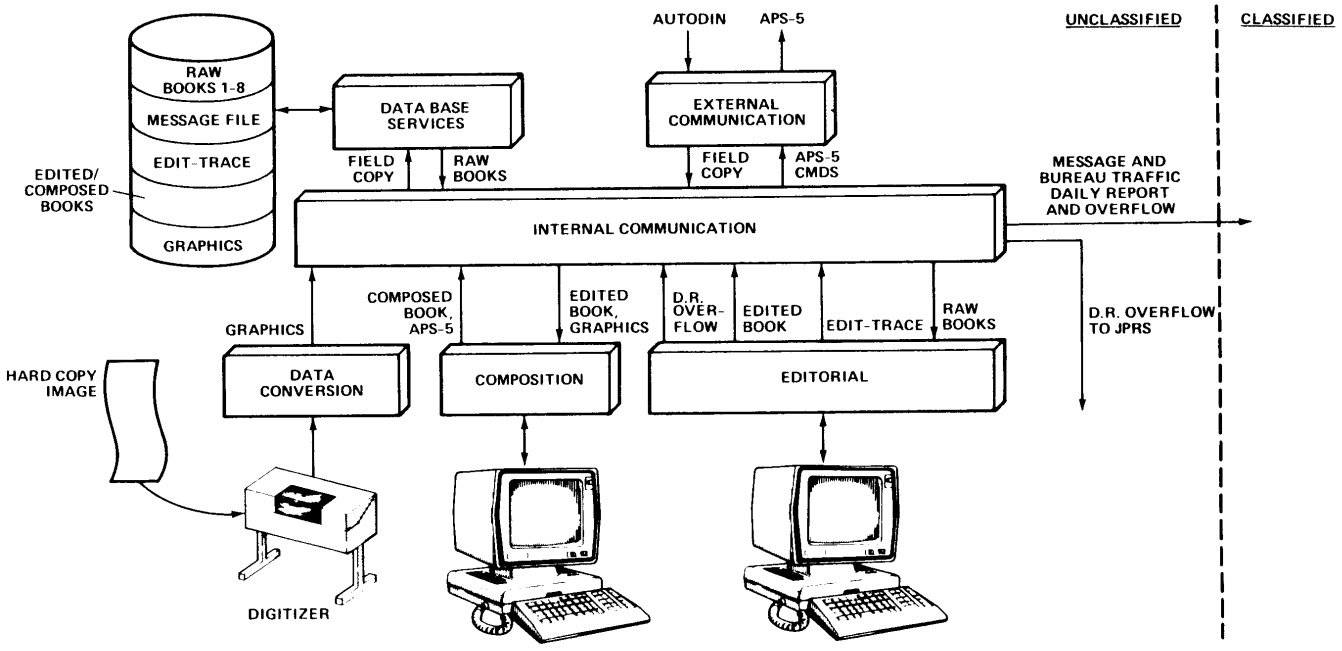
ESL
A Subsidiary of TRW

FBIS–DAILY REPORT DATA FLOW

TRW



WIRE SERVICE/DAILY REPORT SYSTEM

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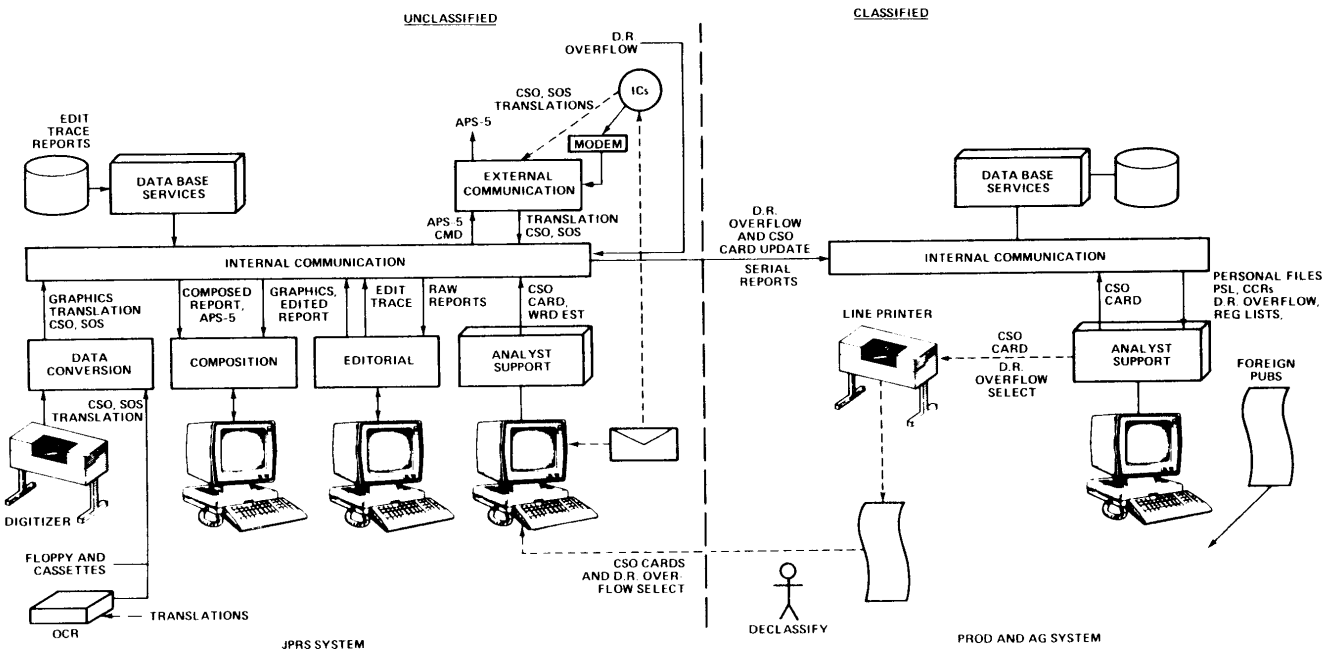
ESL
A Subsidiary of TRW

JPRS SERIAL REPORTS DATA FLOW

TRW



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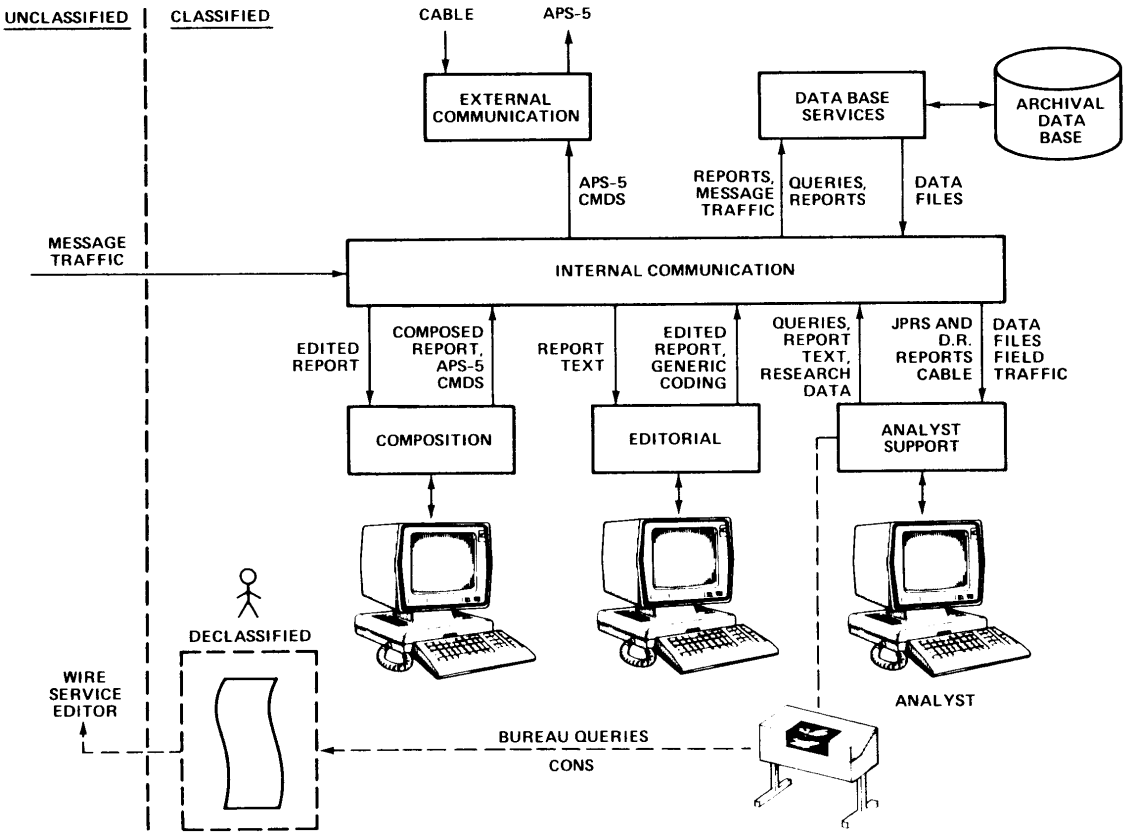
ESL
A Subsidiary of TRW

FBIS–A.G. REPORTS DATA FLOW

TRW



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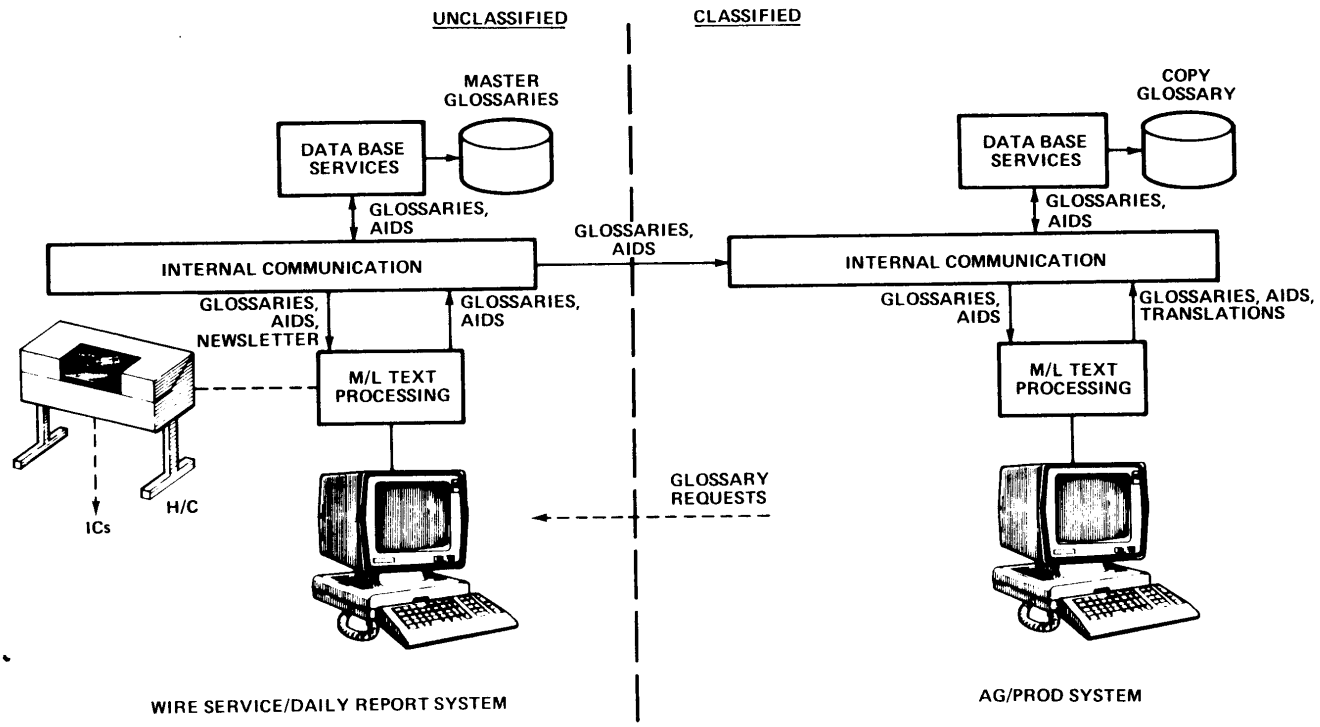
ESL
A Subsidiary of TRW

GLOSSARIES/REFERENCE AIDS DATA FLOW



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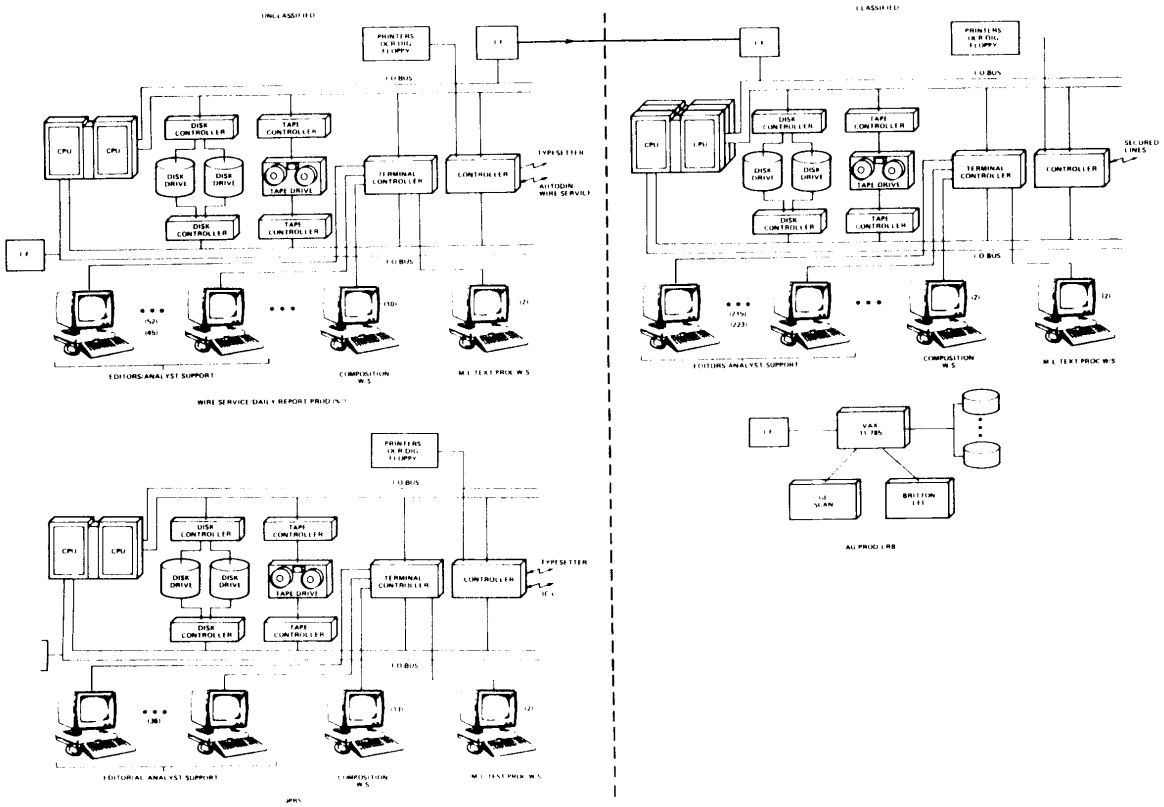
ESL
A Subsidiary of TRW

HEADQUARTERS BLOCK DIAGRAM

TRW



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HEADQUARTERS DESIGN APPROACH

- DESIGN PROCESS
- DESIGN ASSUMPTIONS
- SEGMENTATION
- ARCHITECTURE ALTERNATIVES
- FUNCTIONAL ALLOCATION
- FUNCTIONAL DATA FLOWS

=====> - SIZING

WIRE SERVICE EDITOR TERMINALS

- GIVEN BY PROVIDED MATERIAL
  - MAXIMUM 3 WIRE SERVICE EDITORS
  - NINE EDITORS PER TWO BOOKS (MIDAS)
  - EIGHT DAILY REPORTS
- NUMBER DAILY REPORT EDITORS = 8 X 4.5 = 36
- WIRE SERVICE EDITORS = 3
- SYSTEM SUPPORT (~10%) = 4
- BACKUP & TRAINING (~10%) = 4

  ====

- NUMBER EDITOR TERMINALS ==========> 47

WIRE J W/S

- O ASSUMPTIONS
  - TWO MINUTES TO COMPOSE SINGLE PAGE (FEW GRAPHICS)
  - TWO HOURS FOR FINAL COMPOSITION

- O GIVEN BY PROVIDED MATERIAL
  - 500 PAGES FOR DAILY REPORTS

O FINAL PAGES PER WORKSTATION = 60.0

O NUNBER WORKSTATIONS = 500/60 = 8.3 => 9

O BACKUP & TRAINING (~10%) 1

====

O NUMBER COMPOSITION WORKSTATIONS ======> 10

- ASSUMPTIONS
  - TWO MINUTES TO COMPOSE SINGLE PAGE (FEW GRAPHICS)
  - SIX HOUR ACTUAL COMPOSITION TIME PER DAY

- GIVEN BY PROVIDED MATERIAL
  - 2000 PAGES FOR JPRS SERIAL REPORTS

- PAGES PER WORKSTATION = 180

- NUNBER WORKSTATIONS = 2000/180 = 11.1 => 12

- BACKUP & TRAINING (~10%) 1

- NUMBER COMPOSITION WORKSTATIONS ======> 13

- ASSUMPTIONS
  - TWO MINUTES TO DIGITIZE ONE GRAPHIC
- GIVEN BY PROVIDED MATERIAL
  - THIRTY GRAPHICS PER DAY FOR DAILY REPORT
- CONVERSION TIME PER DAY = 30 X 2 = 60
- NUMBER DIGITIZER WORKSTATIONS = 1
- BACKUP & TRAINING (~10%) = 1

- TOTAL NUMBER DIGITIZER WORKSTATIONS ======> 2

MEDIA FROM ICs (65%):	HANDLING
O HARDCOPY	
- CAMERA READY	OCR, LIGHT EDIT
- DOUBLED SPACE	OCR, HEAVY EDIT
O SOFTCOPY	
- CAMERA READY	EX/INT CONVERSION, LIGHT EDIT
- DOUBLED SPACE	EX/INT CONVERSION, HEAVY EDIT
OTHER MEDIA:	
O GRAPHICS	DIGITIZED
O FBIS GENERATED	LIGHT EDIT

JPRS DATA LOAD ASSUMPTIONS

- GIVEN BY PROVIDED MATERIAL
  - IC TRANSLATION 65% OF JPRS WORKLOAD (1300 PAGES)
  - WORKLOAD DISTRIBUTED BY DESK
    - USSR 36% (468 PAGES)
    - NEAD 35% (455 PAGES)
    - ELAAD 29% (377 PAGES)
  - CAMERA-READY/DOUBLE-SPACED SPLIT DEPENDS ON DESK
    - USSR 80%/20%
    - NEAD & ELAAD 20%/80%

- ASSUMPTIONS
  - IC CAMERA-READY INPUT MEDIA SPLITS
    - 70% ELECTRONIC
    - 30% HARDCOPY
  - IC DOUBLE-SPACED INPUT MEDIA SPLITS
    - 10% ELECTRONIC
    - 90% HARDCOPY
  - EDITING SPEEDS PER WORKSTATION
    - INCLUDES PROOFREADING CONVERSIONS
    - 6 HOURS EDITING PER DAY
    - HEAVY EDIT RATE = 10 PAGES/HOUR = 60 PAGES/DAY
    - LIGHT EDIT RATE = 20 PAGES/HOUR = 120 PAGES/DAY
  - 240 PAGES/DAY PER OCR

---

0 WORKLOADS
- o LIGHT EDIT = 1240 PAGES/DAY
  - -IC CAMERA-READY 540
  - -FBIS GENERATED 700
- o HEAVY EDIT = 760 PAGES/DAY
  - -IC DOUBLED SPACED
- o OCR = 845 PAGES/DAY
- o ELECTRONIC RECEPTION = 454 PAGES/DAY

0 WORKSTATION COUNTS
- o EDITORIAL =========>25
  - - LIGHT EDIT 10.3
  - - HEAVY EDIT 12.6
  - - SPARE & TRAINING 2
- o OCRs =========> 5
  - - REQUIRED 3.52
  - - SPARE & TRAINING 1
- o ELECTRONIC LINKS =========> 4
  - - COMPUTED 1.52
  - - IMPROVE RESPONSE 2

HEADQUARTERS DESIGN

DESIGN ISSUES

DESIGN ISSUES

ISSUES TO BE WORKED

- SECURITY
  - CONTINUED EVALUATION OF "TRUSTED HARDWARE"
  - DETERMINATION OF FOUO IMPACT
  - IMPACT OF TEMPEST REQUIREMENTS ON EQUIPMENT SELECTIONS
- SIZING
  - ANOTHER ITERATION TO INCORPORATE MORE DETAILED OPERATIONAL CONCEPTS AND TIME LINES
- MAN MACHINE INTERFACE
  - ESTABLISHED DETAILED MAN-MACHINE-INTERFACES FOR FBIS OPERATIONS
  - DETERMINE IMPACT OF DIFFERENT USER INTERFACES BETWEEN WORKSTATIONS

DESIGN RISKS

- INTEGRATION OF MULTIPLE COMMERCIAL SYSTEMS INTO COHESIVE FBIS SYSTEM
  - CANDIDATE SYSTEMS NOT COMPATIBLE
  - POTENTIAL IMPACT ON SYSTEM PERFORMANCE
  - MAN MACHINE INTERFACE DIFFERENCES DEGRADE SYSTEM EASE OF USE
  - SOFTWARE DEVELOPMENT TO INTEGRATE VENDOR SYSTEMS AND CUSTOMIZE FOR MORE EFFICIENT FBIS OPERATIONS
- MULTILINGUAL TEXT PROCESSING
  - DEVELOPING TECHNOLOGY

HEADQUARTERS DESIGN BRIEFING SUMMARY

- DEVELOPED FUNCTIONAL STRUCTURE THAT IMPLEMENTS THE MODERNIZED FBIS SYSTEM
- ANALYZED MAJOR DATA FLOWS FOR THE MODERNIZED FBIS SYSTEM
- DEVELOPED HARDWARE MODEL BLOCK DIAGRAM THAT PROVIDES SIZING ESTIMATES FOR FBIS EQUIPMENT

6. HEADQUARTERS DATA BASE DESIGN

HEADQUARTERS DATA BASE

- o Requirements Status and Analysis Update
- o Design Overview
- o Design Approach
- o Design
- o Operation
- o Design Analysis
- o Summary

REQUIREMENTS STATUS AND ANALYSIS UPDATE

----> o Requirements Status and Analysis Update

- Updates to Revised Requirements: NONE

o Design Overview

o Design Approach

o Design

o Operation

o Design Analysis

o Technical Issues

o Summary

DESIGN OVERVIEW

- REQUIREMENTS STATUS AND ANALYSIS UPDATE

----> - DESIGN OVERVIEW
  - DATA CONTENT
  - DATA USAGE
  - KEY REQUIREMENTS
- DESIGN APPROACH
- DESIGN
- OPERATION
- DESIGN ANALYSIS
- TECHNICAL ISSUES
- SUMMARY

DATA CONTENT: ATTRIBUTE FILES

SIZES ARE IN MEGABYTES (MB)	CLAS-SIFIED	JPRS	PROD	ARCHIVE	
				1 YEAR	10 YEARS
SOURCE FILES		(KEPT 1 WEEK)			
DOCUMENT (EXTRACTS: AUTHOR,...)					
JPRS		.05		2.8	28
DAILY, OTHER			.03	1.5	14
ANALYTICAL	X			.2	2
RESEARCH				21.0	210
MESSAGE (EXTRACTS)			5.03		59
CLASSIFIED CABLE (EXTRACTS)	X				20
FIELD COMPLEMENT (EXTRACTS)			.25		3
FOREIGN LANGUAGE SERVICE(EXTR.)	X			1.8	9
CONSOLIDATED TRANSLATION SURVEY				230.0	2300
PRIVATE	SOME				34
REFERENCE AIDS					
REFERENCE AIDS					
TRANSLATION/EDITING		33	33		33
RESEARCH				13.4	459
HANDBOOKS (EXTRACTS)					--

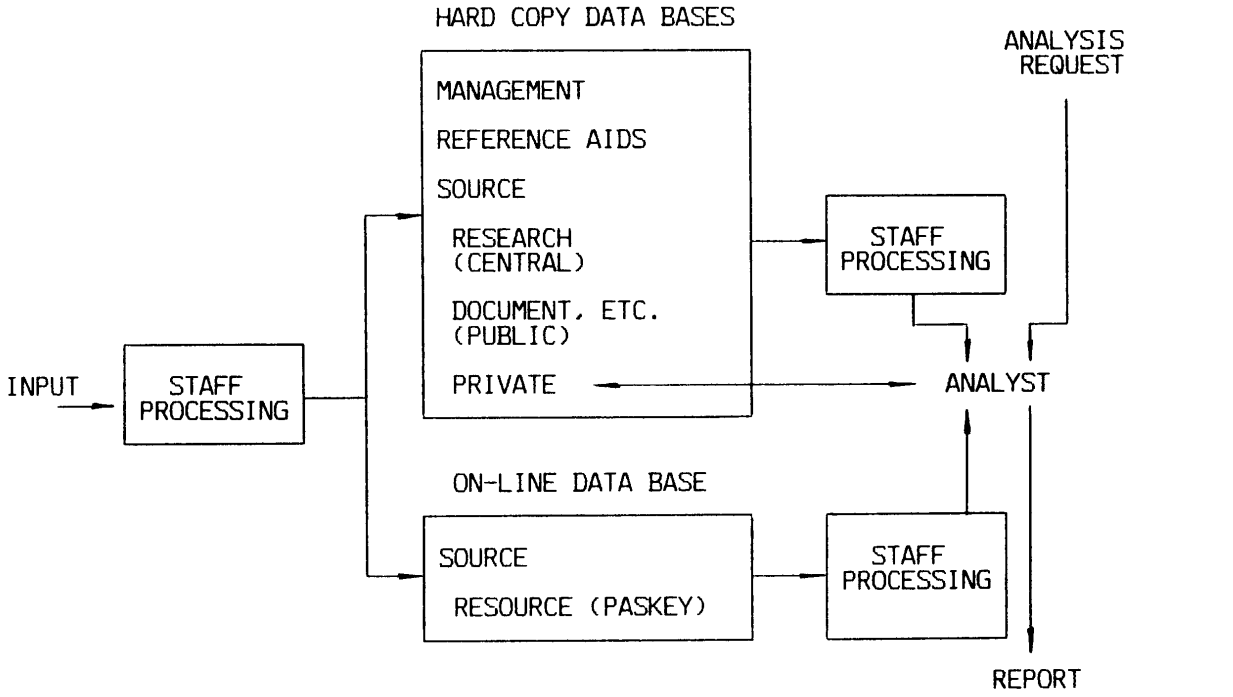
DATA CONTENT: ATTRIBUTE FILES (CONTINUED)

SIZES ARE IN MEGABYTES (MB)	CLAS-SIFIED	JPRS	PROD	ARCHIVE 1 YEAR	ARCHIVE 10 YEARS
MANAGEMENT TASKING AND CONTROL					
REQUIREMENTS	X				.2
PUBLICATION SOURCE				6.0	120.0
SOURCE				73.0	730.0
LATERAL SERVICES		.5	.5		.5
DISTRIBUTION		1.5	1.5		1.5
TRANSLATION RESOURCES		10.0	10.0	10.0	10.0
MONITORING AIDS			1.0		1.0
MONTHLY REPORTS		--	--	.1	.3
LOGISTIC			.6		.6
MANAGEMENT TASKING AND CONTROL		--	--		--
ATTRIBUTE FILES TOTALS		45	52	360	4035

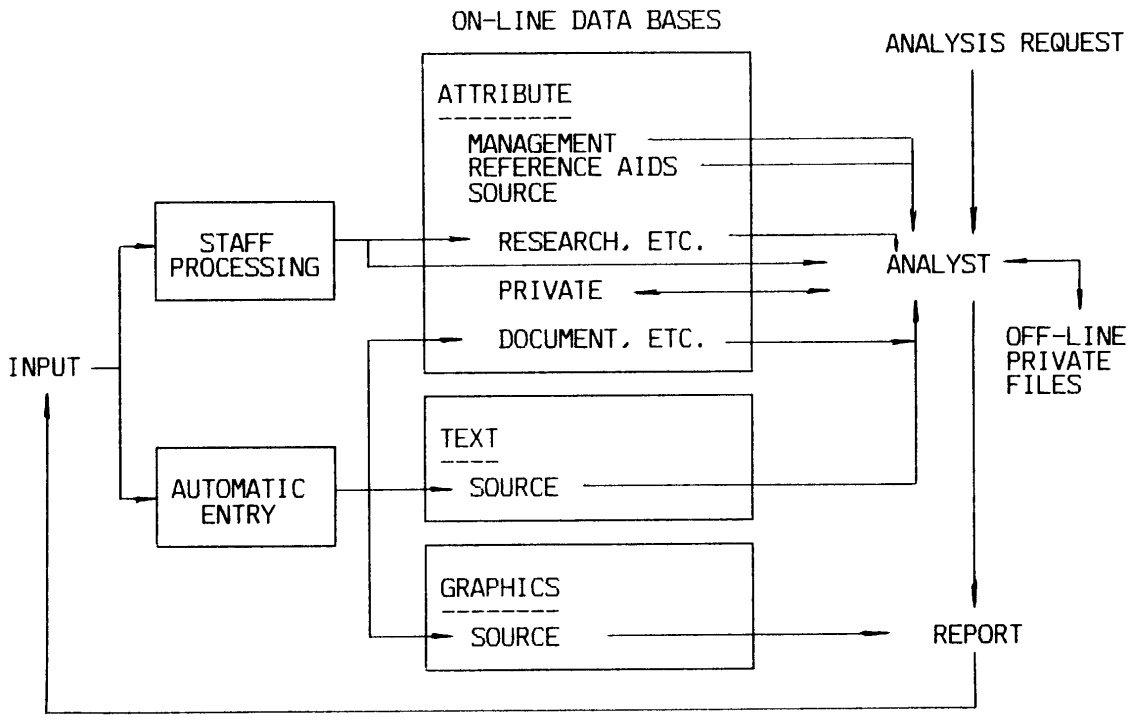
DATA CONTENT: TEXT AND GRAPHICS FILES

SIZES ARE IN MEGABYTES (MB)	CLAS-SIFIED	JPRS (KEPT 1 WEEK)	PROD	ARCHIVE 1 YEAR	ARCHIVE 10 YEARS
SOURCE FILES					
TEXT FILES					
DOCUMENT					
JPRS		50		2600	26000
DAILY, OTHER			20	910	9100
ANALYTICAL	X			40	400
MESSAGE (EXTRACTS)			--		400
CLASSIFIED CABLE (EXTRACTS)	X				100
FIELD COMPLEMENT (EXTRACTS)			--		--
FOREIGN LANGUAGE SERVICE(EXTR.)	X			20	100
PRIVATE	SOME				1800
TEXT FILES TOTALS		50	20	3600	39000
GRAPHICS FILES					
ASSUMES 10 TO 1 COMPRESSION FOR RUN-LENGTH ENCODING.					
DOCUMENT					
JPRS		4.5		234	2340
DAILY, OTHER			2.25	117	1170
ANALYTICAL	X			23	234
GRAPHICS FILES TOTALS		4.5	2.25	374	3744

DATA QUERY:
CURRENT OPERATION



DATA QUERY:
MODERNIZED OPERATION



DATA QUERY: REQUIREMENTS

RETRIEVAL AND REPORT REQUIREMENTS

1.5.1 SEARCH THROUGHOUT THE DATA BASE, ACROSS LOGICAL RELATIONSHIPS

1.5.2 OPERATORS FOR ALL DATA TYPES INCLUDE:

- EQUAL, NOT EQUAL, ETC.
- RANGE STATEMENTS (GREATER THAN AND LESS THAN)

1.5.3 CHARACTER AND TEXT SEARCH CAPABILITIES INCLUDE:

- RECOGNIZE WORD BOUNDARIES (TEXT ONLY)
- "WILD CARD" INDICATORS
- SYNONYM TABLES
- WORD PROXIMITY (TEXT ONLY)
- COMBINATIONS OF THE ABOVE

1.5.4 EXPRESSIONS WILL ALLOW:

- BOOLEAN (AND, OR, M OF N)
- MULTIPLE NESTS AND MULTIPLE-LEVEL NESTING

1.5.5 QUERY MANAGEMENT:

- SEARCH ORIGINAL SOURCE OR SELECTED HIT FILES
- STORE AND MODIFY QUERY SPECIFICATIONS
- DISPLAY NUMBER OF HIT FILES
- CANCEL A SEARCH IN PROGRESS

1.6.1 REPORT GENERATION:

- TYPICAL REPORT GENERATION CAPABILITIES

1.6.2 HIT FILE REVIEW ("BROWSING") -
TO BE SUPPLIED BY THE ANALYST WORKSTATION

DATA QUERY: DESIRABLE CAPABILITIES

PERFORMANCE CONSIDERATIONS

DATA TYPE TO ACCESS	EXAMPLE	DESIRABLE PERFORMANCE
ATTRIBUTE		
SOURCE MATERIALS	SELECT 3000 ITEMS BASED ON COUNTRY, PUBLICATION, ETC.	LESS THAN 5 MINUTES
	SELECT 1 ITEM BASED ON AUTHOR, PUBLICATION, ETC. (E.G., CTS SEARCH)	LESS THAN 10 SECONDS
REFERENCE AIDS	DISPLAY 1 GLOSSARY ENTRY	LESS THAN 10 SECONDS
MANAGEMENT TASKING AND CONTROL	DISPLAY CURRENT STATUS OF A CSO REQUEST	LESS THAN 10 SECONDS
TEXT		
SOURCE MATERIALS	SEARCH 3000 ITEMS FOR A SET OF TOPICS, TO REDUCE TO 200-300 FOR BROWSING	10 MINUTES

(CONTINUED)

Other Desirable Features

- User Interface
  - Integrated, consistent
  - Full access to data base capabilities
  - Easy-to-learn, easy-to-use

KEY REQUIREMENTS

- o Complete and flexible data base query capabilities
- o File Organization
  - Supports all files shown in Exhibit A
- o Attribute Storage and Search:
  - Number of Items: 420,000 Items Increase per Year; 4,370,000 Items Total in 10 Years
  - Size: 410 Megabytes Increase per Year; 4700 Megabytes Total in 10 Years
  - Queries: Fully flexible query operations
  - Performance: Desired as previously described
- o Text Storage and Search:
  - Size: 3500 Megabytes Increase per Year; 39000 Megabytes Total in 10 Years
  - Performance: Desired as previously described
- o User Interface
  - Full access to data base query facilities
  - Easy to learn and use

DESIGN APPROACH

- REQUIREMENTS STATUS AND ANALYSIS UPDATE
- DESIGN OVERVIEW

---->

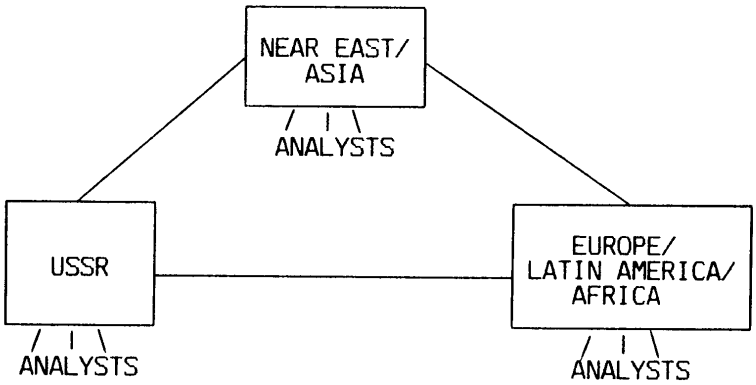
- DESIGN APPROACH
  - EVALUATION CRITERIA
  - OVERALL ARCHITECTURES
  - CENTRALIZED DATA BASE ARCHITECTURES
  - ATTRIBUTE DATA BASE VENDORS
  - TEXT DATA BASE VENDORS
- DESIGN
- OPERATION
- DESIGN ANALYSIS
- TECHNICAL ISSUES
- SUMMARY

DESIGN EVALUATION CRITERIA

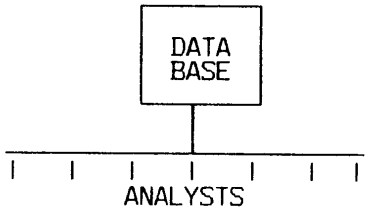
CRITERIA	MEASURE
REQUIRED FUNCTIONALITY	MEETS PARTIALLY MEETS (%) DOES NOT MEET
IMPLEMENTATION RISK	MINIMAL: NO DEVELOPMENT REQUIRED LOW: SIMPLE DEVELOPMENT REQUIRED HIGH: REQUIRES TECHNIQUES CURRENTLY UNDER RESEARCH
DESIRED PERFORMANCE	ACHIEVES APPROACHES, WITH IMPROVEMENTS ANTICIPATED DOES NOT ACHIEVE
COST	LOW REASONABLE HIGH
INCREMENTAL GROWTH	ACCOMMODATED EXCLUDED
SUBSYSTEM UPGRADING MODULARITY	ACCOMMODATED EXCLUDED
INTERFACE FLEXIBILITY	HIGH: MANY CHOICES LOW: FEW CHOICES SINGULAR: ONLY 1 SUPPORTED

OVERALL ARCHITECTURES

DECENTRALIZED (EXAMPLE):



CENTRALIZED:



OVERALL ARCHITECTURES: EVALUATION

CRITERIA	DECENTRALIZED	CENTRALIZED
REQUIRED FUNCTIONALITY	MEETS	MEETS
IMPLEMENTATION RISK	HIGH: PROTOTYPE SOLUTIONS IN RESEARCH ENVIRONMENT ONLY	LOW: STANDARD APPROACH
DESIRED PERFORMANCE	BETTER THAN CENTRALIZED FOR LOCAL QUERIES; WORSE FOR GLOBAL QUERIES	APPROACHES
COST	ACQUISITION REASONABLE; DEVELOPMENT HIGHER	REASONABLE
INCREMENTAL GROWTH	EASIER THAN CENTRALIZED	ACCOMMODATED
SUBSYSTEM UPGRADING MODULARITY	ACCOMMODATED	DEPENDS UPON DETAILED ARCHITECTURE
INTERFACE FLEXIBILITY	HIGH	HIGH

CONCLUSION

A CENTRALIZED ARCHIVAL DATA BASE

CENTRALIZED ARCHITECTURES: ALTERNATIVES

- SOFTWARE-BASED GENERAL PURPOSE
  - SOFTWARE PACKAGE ON GENERAL PURPOSE HARDWARE, WITH GENERAL APPLICABILITY
  - EXAMPLES:

HIERARCHICAL	NETWORK	RELATIONAL
IBM IMS	CULLINANE IDMS	RTI INGRES
MRI SYSTEM 2000	CINCOM TOTAL	RSI ORACLE
		IBM SYSTEM R

- HARDWARE-BASED GENERAL PURPOSE
  - LOW-LEVEL SOFTWARE ON SPECIAL PURPOSE HARDWARE, WITH GENERAL APPLICABILITY
  - EXAMPLES:

BRITTON LEE IDM	INTEL DBP
SYNAPSE N+1	SOFTWARE AG ESP/ADABUS

CENTRALIZED ARCHITECTURES: ALTERNATIVES (CONTINUED)

- Software-based Library/Text Systems
  - Software package on general purpose hardware, specifically implemented for library research
  - Examples:

    TRW SAFE
    TRW GIM II
    Cuadra STAR
    Informatics ISS
    Batelle Basis
    IBM Stairs
    UCB Melvyl
    Lockheed Dialog

- Hardware-based Text Search
  - Low-level software on special hardware, specifically oriented toward text searching
  - Examples:

    TRW Fast Data Finder (FDF)
    General Electric GESCAN II
    Datafusion Associate File Processor (AFP)

    Research Systems:

    Naval Postgraduate School
    University of Utah
    University of Florida

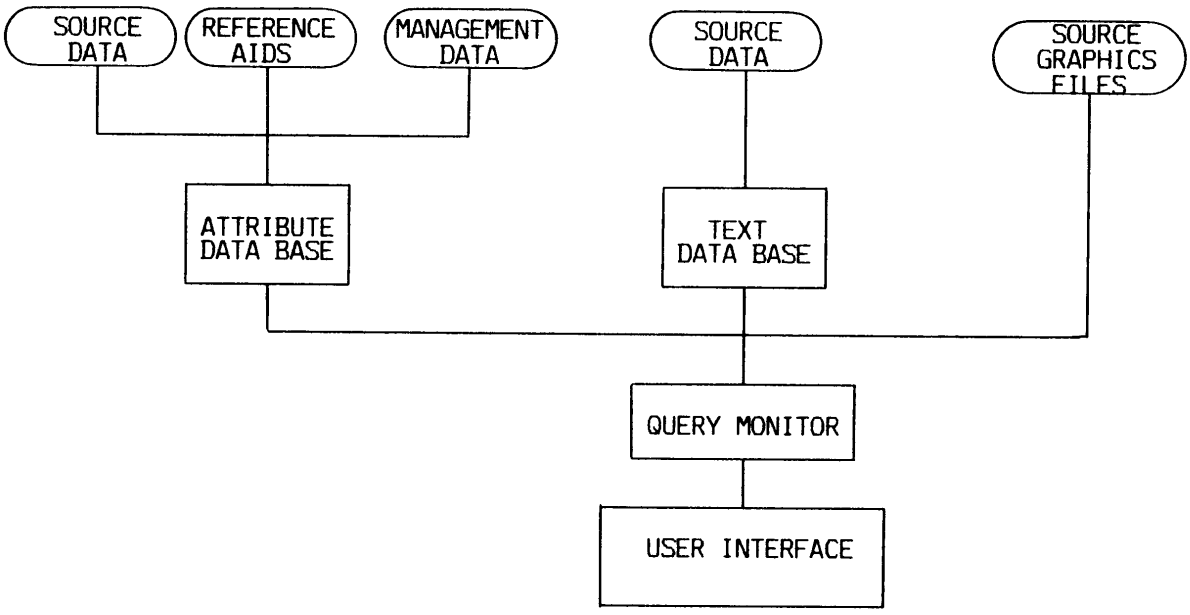
CENTRALIZED ARCHITECTURES: EVALUATION

	SOFTWARE GENERAL PURPOSE	HARDWARE GENERAL PURPOSE	SOFTWARE LIBRARY/TEXT	HARDWARE TEXT SEARCH
REQUIRED FUNCTIONALITY				
- DATA TYPES				
- ATTRIBUTE	YES	YES	PARTIAL YES	NO
- TEXT	DIFFICULT OR NO	DIFFICULT OR NO	YES	YES
- RETRIEVAL				
- ATT. SEARCH (1.5.1,2.,4)	YES	YES	YES	NO
- TEXT SEARCH (1.5.1-1.5.5)	POSSIBLE BUT EXTREMELY SLOW	POSSIBLE BUT EXTREMELY SLOW	NO	YES
- REPORTS (1.6.1)	YES	YES	LIMITED	YES
- HIT REVIEW (1.6.2)	YES	YES	YES	YES
IMPLEMENTATION RISK	MINIMAL	MINIMAL	MINIMAL	LOW
DESIRED PERFORMANCE				
- ATT. SEARCH	SLOW	APPROACHES	ACHIEVES	N/A
- TEXT SEARCH	EXTREMELY SLOW	EXTREMELY SLOW	N/A	APPROACHES

CONCLUSION

A COMBINATION OF ARCHITECTURES, INCLUDING OPERATING SYSTEM FILE MANAGEMENT, IS NEEDED TO SATISFY FBIS REQUIREMENTS.

CENTRALIZED ARCHITECTURES: RESULT



ATTBRIBUTE DB VENDORS: FEATURES

	IBM IMS	RTI INGRES	BRITTON LEE IDM 500	UCB MELVYL
CHARACTERISTICS	HIERARCHICAL	RELATIONAL - FLEXIBILITY - DATA INDEPENDENCE	RELATIONAL	SPECIAL STRUCTURES
FUNCTIONAL CAPABILITIES				
- DATATYPES				
- SOURCE	YES	YES	YES	YES
- REF. AIDS	YES	YES	YES	UNKNOWN
- MT&C	YES	YES	YES	NO
- RETRIEVE				
- OPERATORS	YES	YES	YES	YES
- EXPRESSIONS	YES	YES	YES	YES
- REPORT GEN.	YES	YES	YES	MINIMAL

ATTBRIBUTE DB VENDORS: FEATURES

	IBM IMS	RTI INGRES	BRITTON LEE IDM 500	UCB MELVYL
PERFORMANCE				
- METHOD	NAVIGATION OF HIERARCHY, OF INDICES	QUERY DECOMPOSITION, THEN JOIN(S), WITH INDEX SEARCH		SIMPLE INDEXED SEARCH
- RESULTS, EST. FOR 2 MILLION TO 100 HITS	UNKNOWN	> 10 MINUTES	> 1 MINUTE	< 1 MINUTE
USER INTERFACE	COMMANDS; VERY COMPLEX (BATCH-ORIENTED)	COMMANDS: COMPLEX, POWERFUL; FORMS: SIMPLE, LESS POWERFUL		COMMANDS; LIMITED, SIMPLE
STORAGE CAPACITY	GIGABYTE(S)	200 MB (MAX. NOW IN USE)	7 GB (MAX. NOW IN USE)	GIGABYTE (2 MILLION ENTRIES)
PRACTICAL NUMBER OF USERS	> 100	~ 10	UNKNOWN	200+
MODIFIABILITY				
- FILE STRUCTURES	DIFFICULT	EASY	EASY	DIFFICULT
- SYSTEM ENHANCEMENTS	VERY DIFFICULT	MODERATE	VERY DIFFICULT	DIFFICULT

ATTRIBUTE DB VENDORS: EVALUATION

CRITERIA	IBM IMS	RTI INGRES	BRITTON LEE IDM 500	UCB MELVYL
REQUIRED FUNCTIONALITY	MEETS	MEETS	MEETS	PARTIALLY MEETS
IMPLEMENTATION RISK	MEDIUM	LOW	LOW	HIGH
DESIRED PERFORMANCE	UNKNOWN	DOES NOT ACHIEVE	APPROACHES	APPROACHES
COST	HIGH	LOW	REASONABLE	NOT AVAILABLE COMMERCIALLY
INCREMENTAL GROWTH	ACCOMMODATED	ACCOMMODATED	ACCOMMODATE	UNKNOWN
SUBSYSTEM UPGRADING MODULARITY	EXCLUDED	ACCOMMODATED	ACCOMMODATED	EXCLUDED
INTERFACE FLEXIBILITY	LOW	HIGH	HIGH	UNKNOWN

CONCLUSION

BRITTON LEE AS INITIAL CHOICE FOR FURTHER DESIGN INVESTIGATION.

TEXT SEARCH VENDORS: FEATURES

	TRW FDF	GE GESCAN II	DATAFUSION AFP
ARCHITECTURAL FEATURES	SYSTOLIC ARRAY (PROGRAMMABLE)	PARALLEL QUERY PROCESSORS (UP TO 128, UP TO 1000+ BYTES EACH)	8192 BYTES OF QUERY TERMS
FUNCTIONAL CAPABILITIES			
- BITS/CHARACTER, CHARACTERS MATCHABLE	8,256	8,256	ASCII
- EXACT MATCH	YES	YES	YES
- FIXED LENGTH "DON'T CARES"	YES	YES	YES
- VARIABLE LENGTH "DON'T CARES"	YES	YES	NO
- PROXIMITY	YES	YES	YES
- BOOLEAN (AND,OR)	YES	YES	YES
- CHARACTER STRING RANGING	YES	VERY LIMITED	VERY LIMITED
- NUMERIC RANGING	YES	VERY LIMITED	VERY LIMITED
- NEAR TERM MATCH (E.G., 6 OUT OF 10)	NOT IMPLEMENTED (1)	YES	VERY LIMITED
- USER-SPECIFIED ERROR TOLERANCE	YES (2)	NO	NO

NOTES: (1) CANNOT BE DONE WITH 1 SYSTOLIC ARRAY
(2) UNCLEAR HOW THIS IS DONE FROM THE DESCRIPTION OF THE LANGUAGE

TEXT SEARCH VENDORS: FEATURES (CONTINUED)

	TRW FDF	GE GESCAN II	DATAFUSION AFP
PERFORMANCE	4 MB/SEC	2 MB/SEC	~ 1 MB/SEC (ON COMPRESSED FILE FORMAT)
(THEORETICAL; ALL ARE LIMITED TO DISK TRANSFER RATES, ABOUT .8 MB/SEC.)			
USER INTERFACE	SEARCH SPEC. LANGUAGE ONLY	TABULAR QUERY LANG.	"NATURAL" AND STRUCTURED LANGUAGES
COMPATIBLE SYSTEMS	SUN WORKSTATION	VAX 11/78x PDP 11/24-70	VAX 11/78x PDP 11/23-70
DISK STORAGE CAPACITY	1000-2000 MEGABYTES	160,000 MEGABYTES	UNKNOWN

TEXT SEARCH VENDORS: EVALUATION

CRITERIA	TRW FDF	GE GESCAN II	AFP
REQUIRED FUNCTIONALITY	WILL EXCEED, WHEN COMPLETE	MEETS	DOES NOT MEET
IMPLEMENTATION RISK	HIGH; USEFUL CONFIGURATIONS NOT AVAILABLE	LOW	
DESIRED PERFORMANCE	APPROACHES	APPROACHES	
COST	REASONABLE	REASONABLE	
INCREMENTAL GROWTH	EXCLUDED (AS OF NOW)	ACCOMMODATED; USES DEC VAX DISK STORAGE	
SUBSYSTEM UPGRADING MODULARITY	ACCOMMODATED	ACCOMMODATED	
INTERFACE FLEXIBILITY	DEBATABLE; ETHERNET	HIGH; INTERFACES THROUGH VAX HOST	

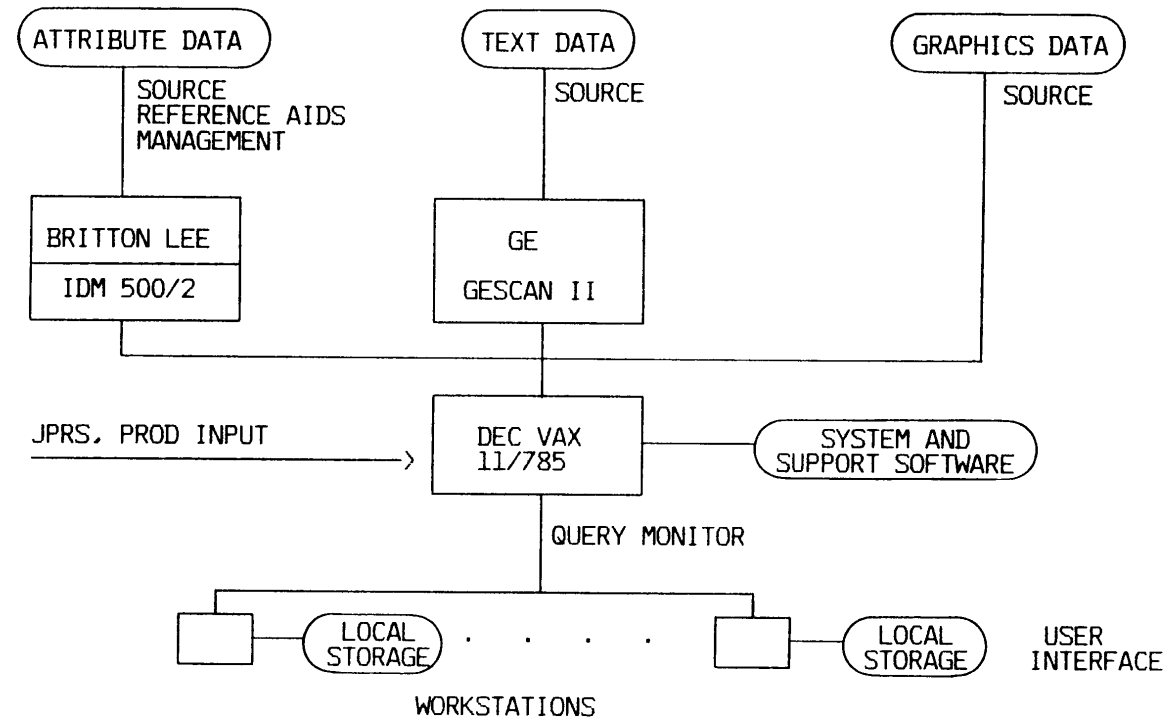
CONCLUSION

SELECT GE GESCAN II FOR FURTHER DESIGN INVESTIGATION.

MODEL DATA BASE DESIGN

- REQUIREMENTS STATUS AND ANALYSIS UPDATE
- DESIGN OVERVIEW
- DESIGN APPROACH
- ----> DESIGN
- OPERATION
- DESIGN ANALYSIS
- TECHNICAL ISSUES
- SUMMARY

DATA BASE DESIGN



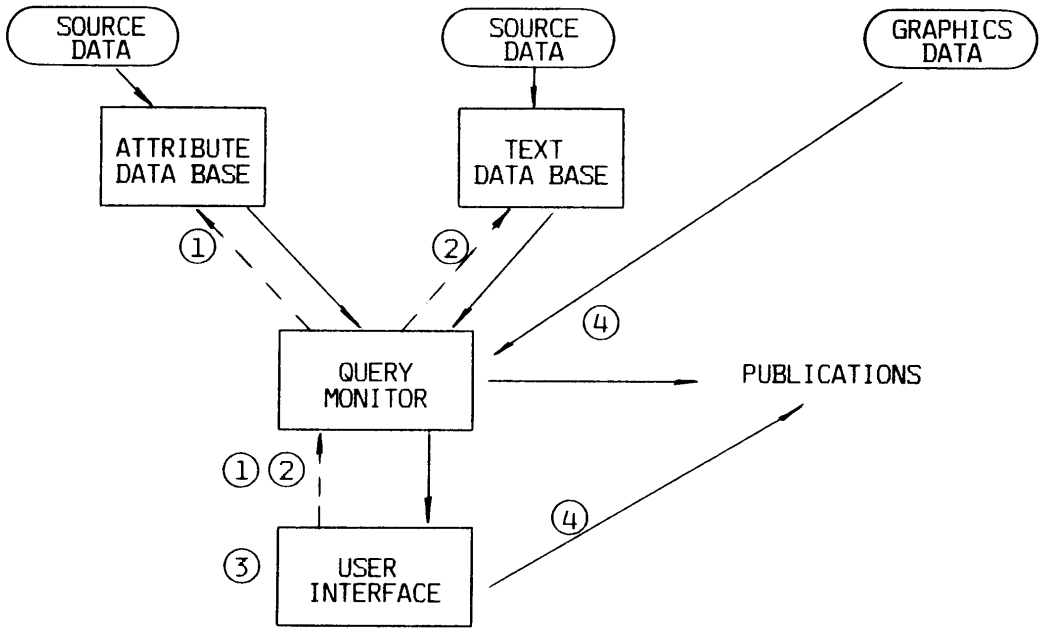
DATA BASE OPERATION

- REQUIREMENTS STATUS AND ANALYSIS UPDATE
- DESIGN OVERVIEW
- DESIGN APPROACH
- DESIGN

----> - OPERATION
  - RESEARCH QUERIES
  - OPERATIONAL QUERIES

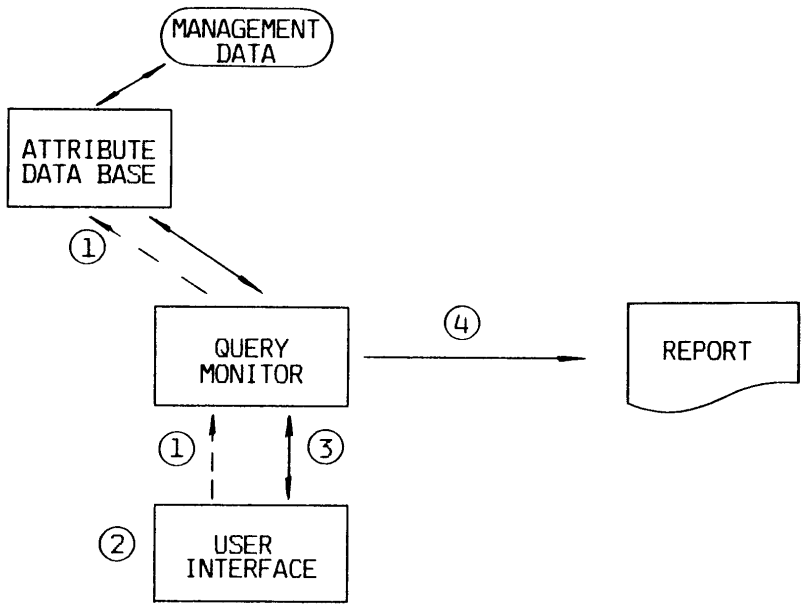
- DESIGN ANALYSIS
- TECHNICAL ISSUES
- SUMMARY

RESEARCH QUERY



1. PERFORM ATTRIBUTE QUERY (MAY ITERATE)
2. PERFORM TEXT QUERY
3. REVIEW AND USE RESULTS
4. SEND COPY, WITH DESIRED GRAPHICS, TO PUBLICATIONS

MANAGEMENT INTERACTION



1. ENTER ATTRIBUTE QUERY
2. REVIEW AND PONDER RESULTS
3. ENTER UPDATED INFORMATION
4. GENERATE REPORT, IF DESIRED

DATA BASE DESIGN ANALYSIS

- o Requirements Status and Analysis Update
- o Design Overview
- o Design Approach
- o Design
- o Operation

----> o Design Analysis

- o Technical Issues
- o Summary

OVERALL DESIGN ANALYSIS

CRITERIA	BRITTON LEE/GESCAN/VAX/WORKSTATIONS
REQUIRED FUNCTIONALITY	MEETS, WITH POSSIBLE EXCEPTIONS DEPENDING UPON THE USER INTERFACE SELECTED: 1.5.4.1 BOOLEAN EXPRESSION: M OF N 1.6.1.6 REPORT HIGHLIGHTING
IMPLEMENTATION RISK	
SUBSYSTEM INTERFACES	LOW
USER INTERFACE	MINIMAL: BRITTON LEE AND GESCAN CAN BE USED DIRECTLY LOW: QUERY MONITOR AND USER INTERFACE
DESIRED PERFORMANCE	APPROACHES
ATTRIBUTE/SOURCE:	WILL SELECT 3000 ITEMS IN 15 MINUTES
TEXT/SOURCE:	WILL SEARCH 3000 ITEMS IN 30 MINUTES
COST	REASONABLE
INCREMENTAL GROWTH	ACCOMMODATED
SUBSYSTEM UPGRADING MODULARITY	ACCOMMODATED
INTERFACE FLEXIBILITY	HIGH

TECHNICAL ISSUES

- REQUIREMENTS STATUS AND ANALYSIS UPDATE
- DESIGN OVERVIEW
- DESIGN APPROACH
- DESIGN
- OPERATION
- DESIGN ANALYSIS
- ----> TECHNICAL ISSUES
- SUMMARY

TECHNICAL ISSUES

TOPIC	ACTION
INVESTIGATION TOPICS	
MACHINE-ASSISTED TEXT KEYWORDING	TO SPEED QUERY SEARCH AND RETRIEVAL, INVESTIGATE APPROACHES TO USING THE TEXT SEARCH TO ASSIST IN KEYWORDING TEXT MATERIALS
ATTRIBUTE AND TEXT DATA QUERY PERFORMANCE	TO INSURE THE QUERY PERFORMANCE WILL KEEP PACE WITH THE GROWTH OF THE SOURCE AND MANAGEMENT DATA BASE, FOLLOW AND ASSESS TECHNOLOGY DEVELOPMENTS IN ATTRIBUTE AND TEXT DATA BASE SYSTEMS, SUCH AS THE USE OF VLSI DESIGNS ALSO, FOLLOW AND ASSESS THE INTEGRATION OF NEW DISK TECHNOLOGY IN THESE SYSTEMS
TEXT DATA BASE STORAGE	TO REDUCE HARDWARE REQUIREMENTS AND COSTS, INVESTIGATE INVESTIGATE ALTERNATIVE MASS STORAGE DEVICES, SUCH AS OPTICAL DISKS ALSO, INVESTIGATE MULTIPLE-LEVEL STORAGE (HIGH-SPEED DISK FOR RECENT ENTRIES, OTHER DEVICES FOR OLDER)
FUTURE CONSIDERATIONS	
MACHINE TRANSLATION	INVESTIGATE THE IMPLICATIONS OF ADVANCES IN MACHINE MACHINE TRANSLATION ON THE DATA BASE ARCHITECTURE
AUTOMATIC DISSEMINATION	INVESTIGATE APPROACHES TO USE TEXT PROCESSING FOR THE PURPOSE OF DISSEMINATION, AND ASSESS POTENTIAL IMPLICATIONS ON DATA BASE ARCHITECTURE

DATA BASE SUMMARY

- o Requirements Status and Analysis Update
- o Design Overview
- o Design Approach
- o Design
- o Operation
- o Design Analysis
- o Technical Issues

----> o Summary

DATA BASE SUMMARY

- ACHIEVES ALL FUNCTIONAL REQUIREMENTS, WITH ONLY VERY MINOR EXCEPTIONS
- MODERATE RISK
- ADEQUATE PERFORMANCE, WITH TECHNOLOGICAL ADVANCES EASY TO INTEGRATE
- REASONABLE COST
- VERY FLEXIBLE AND EXTENDABLE

7. PROGRAM RISKS

RISKS AND DEFICIENCIES

- INTEGRATION OF OFF THE SHELF SUBSYSTEMS
- LONG TERM TECHNOLOGY SUPPORT BY VENDORS
- SUITABILITY OF DESIGN FOR INTENDED USE
- TRANSITION TO NEW SYSTEMS (TECHNOLOGY TRANSFER)
- ELECTRONIC CAPTURE OF EXISTING FILES
- DATA BASE SEARCH PERFORMANCE VERSUS EXPECTATIONS
- ADEQUACY OF MULTILINGUAL TECHNOLOGY

8. TRAINING PLANS

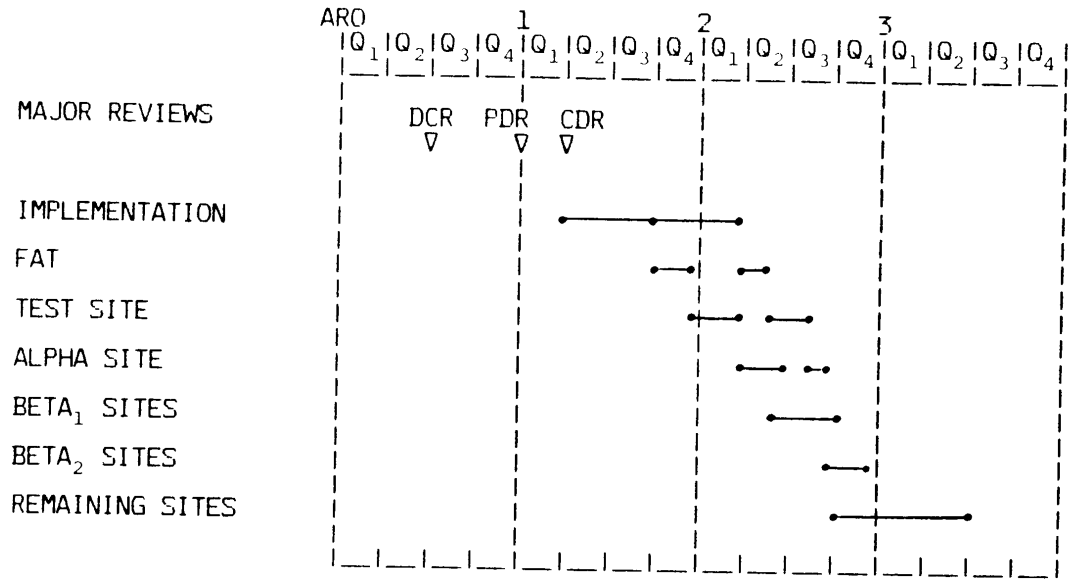
TRAINING CONCERNS

- TECHNICAL EXPERIENCE OF USER
- ENGLISH LANGUAGE COMPETENCY
- CULTURAL EFFECTS OF NEW TECHNOLOGY
- MAINTAINING DAILY OPERATIONS

TRAINING DEVELOPMENT METHODOLOGY

- PERFORM TRAINING NEEDS ANALYSIS (TNA)
  - CRITICAL TASKS
  - FREQUENT TASKS
  - INFREQUENT TASKS
- INCORPORATE VENDOR MATERIAL
- PREPARE MATERIALS
  - DRAFT/OUTLINE
  - PRELIMINARY VERSION
  - FIELDED VERSION

SCHEDULE – BUREAU



BUREAU COURSES

		SESSIONS
0	MANAGEMENT/ADMINISTRATIVE OVERVIEW	1*
0	USER	10*
0	EDITOR	1
0	SUPERVISOR	1
0	SYSTEM MANAGER	1

*1/2 DAY

USER COURSE OUTLINE

- COURSE OVERVIEW
- COMPUTER BASICS*
- SYSTEM BASICS*
- FBIS SYSTEM OVERVIEW*
- TERMINAL USAGE*
- DEMO SESSIONS
- PRACTICAL EXERCISES

*VIDEO TAPE SUPPORT

MAINTENANCE TRAINING (TBR)

- PROVIDE INTRODUCTORY TRAINING AT FLAGSHIP SITES
- ASSIST IN SITE INSTALLATION
- PRESENT INDEPTH ON-SITE COURSE
- PRODUCE SITE-SPECIFIC "TOI" VIDEO

TOI

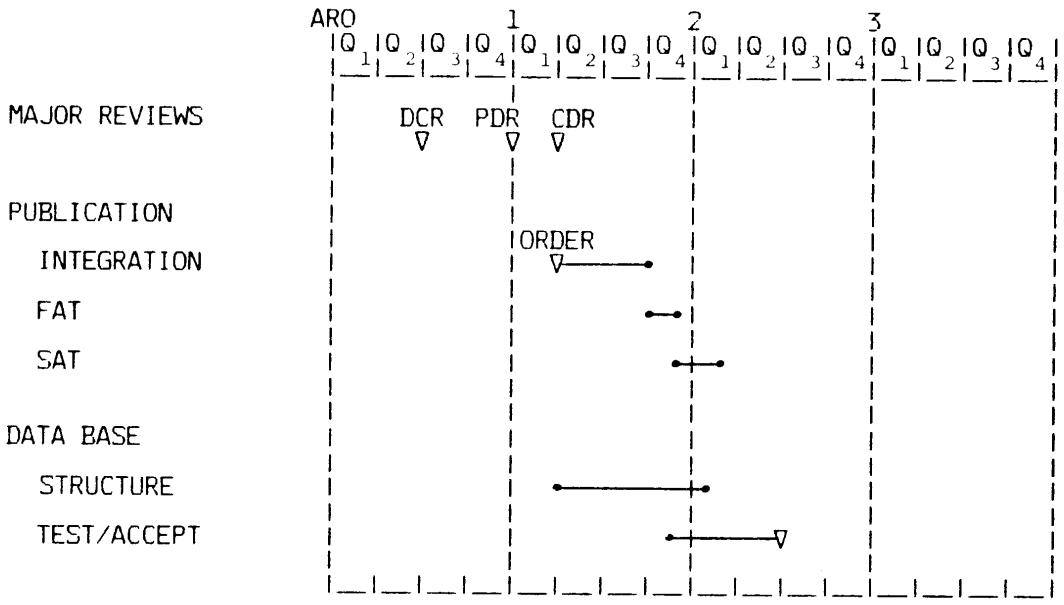
TRANSFER OF INFORMATION

DEFINITION: VIDEO TAPE RECORDED DURING THE ACTUAL PERFORMANCE OF A TASK.

TRAINING COURSE MATERIALS

- INSTRUCTOR GUIDE
- STUDENT GUIDE WITH "JOB AID"
- SELF-PACED WORKBOOK
- PRODUCED VIDEO MEDIA
- TOI

SCHEDULE — HEADQUARTERS



HEADQUARTERS COURSES

DATA BASE

		SESSIONS
0	MANAGER/ADMINSTRATIVE OVERVIEW	1
0	SYSTEM OVERVIEW	1
0	DATA BASE USER	10
0	SYSTEM MANAGER	TBR

PUBLICATIONS

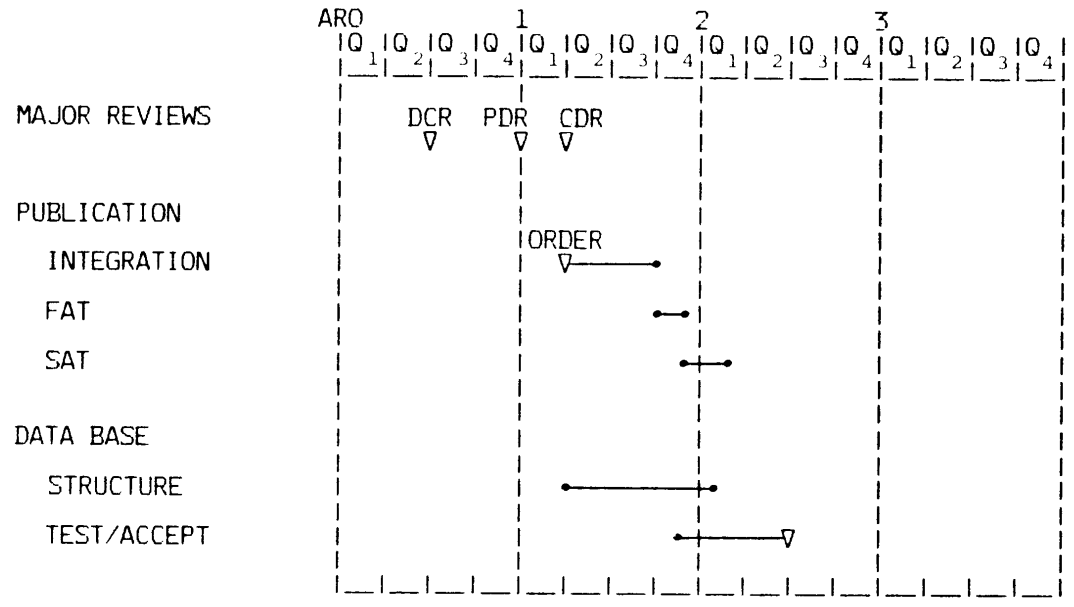
0	VENDOR SUPPLIED
0	FOCUSED ON TRAINING THE TRAINER

9. PROGRAM SCHEDULES

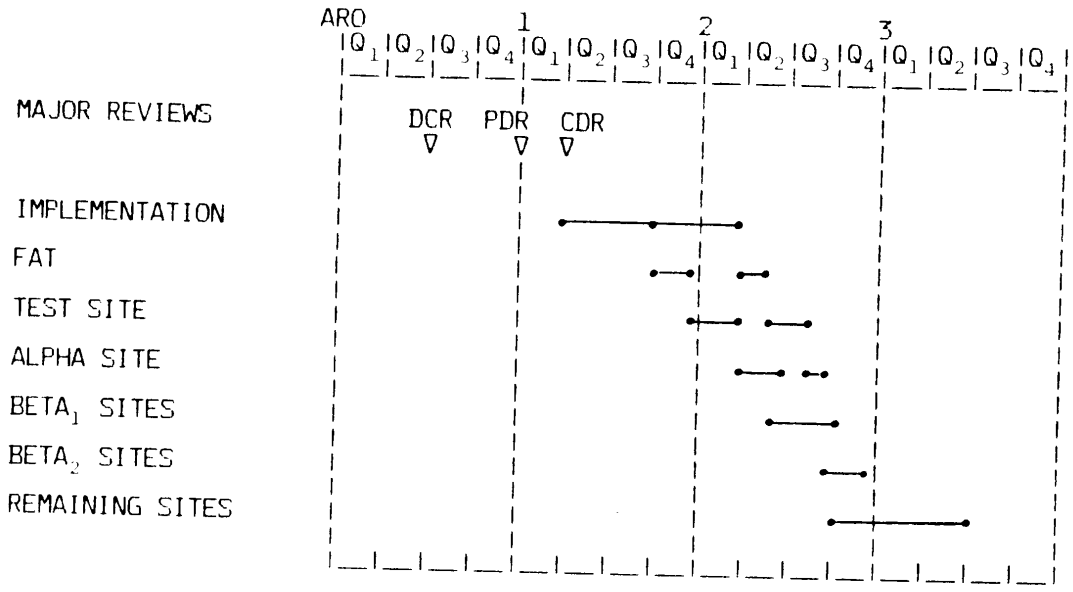
PROJECT CHARACTERISTICS

- INTEGRATE OFF-THE-SHELF SUBSYSTEMS
- STRUCTURE FBIS DATA BASE
- INSTALL AND SUPPORT WORLDWIDE SITES

SCHEDULE — HEADQUARTERS



SCHEDULE – BUREAU



DESIGN PHASE -- DCR

- SEGMENT OPERATIONS CONCEPT
- SEGMENT DESIGN SPECIFICATIONS
- SEGMENT DEVELOPMENT PLAN
- OPERATIONAL POLICIES AND GUIDLINES

DESIGN PHASE -- PDR (PRELIMINARY PLANS)

- OPERATIONS MAINTENANCE AND LOGISTICS
- TRAINING
- TEST
- VERIFICATION
- FACILITY INTERFACE DRAWING
- SITE INSTALLATION

DESIGN PHASE -- PDR (SPECIFICATIONS)

- REQUIREMENTS TRACEABILITY MATRIX
- INTRASEGMENT SPECIFICATIONS
- SUBSYSTEM SPECIFICATIONS
- HARDWARE SPECIFICATIONS
- SOFTWARE SPECIFICATIONS
- DATA BASE SPECIFICATIONS

DESIGN PHASE -- CDR

- COMPLETE BUILD-TO SPECIFICATIONS
- FINALIZE PLANS

IMPLEMENTATION PHASE

- PUBLICATIONS SYSTEM INTEGRATION
- DATA BASE STRUCTURE
- SYSTEM STAGING
- FACTORY ACCEPTANCE TEST (FAT)
- SITE PREPARATION (GOV'T)

HEADQUARTERS STAGING PLAN (TBR)

- STAGING AT MARYLAND LABORATORY
  - PREINSTALLATION TESTING
  - TRAINING
- REQUIRES: AUTODIN DROP (GFE)

OPERATIONS AND MAINTENANCE PHASE

- ASSUME 3-YEAR TURNOVER
- ESTIMATED AT 1% COST/YEAR

10. PROGRAM COSTS

COSTING ASSUMPTIONS

Total 63
49 sys. bug
+14 Cost

1. H/W — HQ — $6M--PUB, $7M--DB
   FB — $1M/SITE

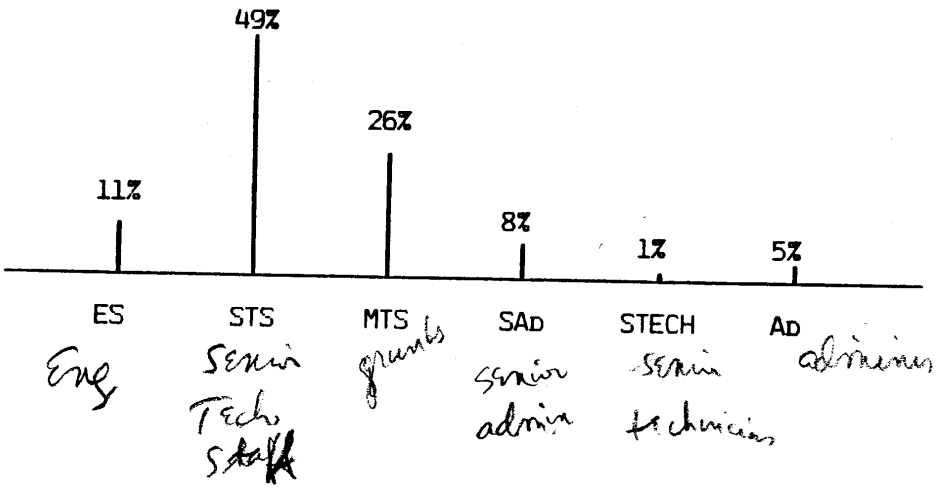
2. FACILITY PREPARATION--GFE

3. 20K-30K LINES OF CODE (TEMPIOP MODEL)

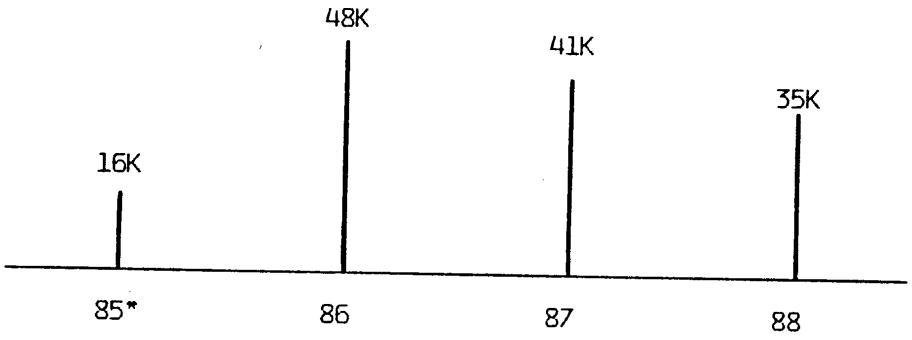
4. WORK ORDER MANAGEMENT INVOLVES LEAD TECHNICAL RESPONSIBILIES

5. TRAVEL CENTROIDS
   - VIENNA/LONDON
   - TOKYO/HONG KONG
   - TEL AVIV
   - WASHINGTON DC

LABOR DISTRIBUTION



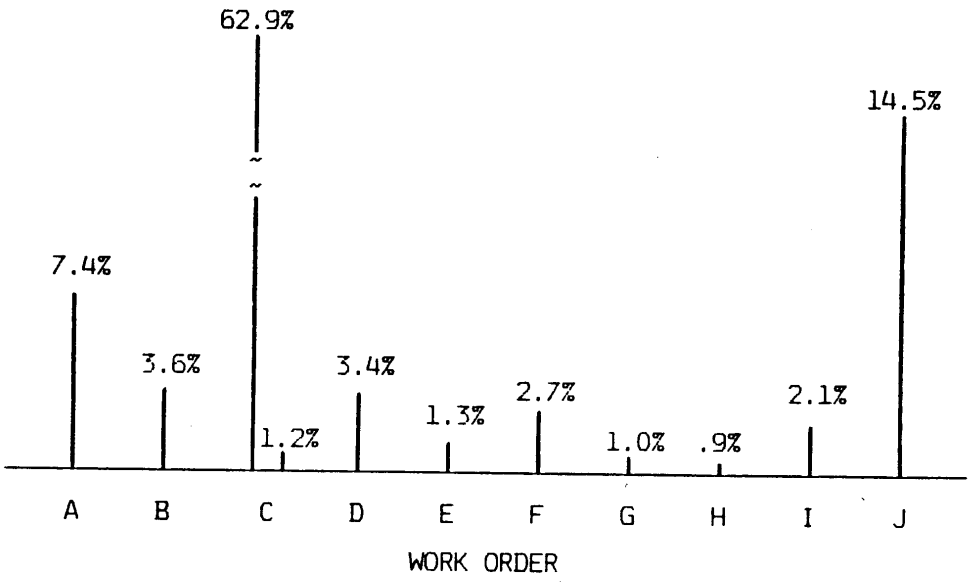
LABOR HOURS BY YEAR



STAFF LEVEL ~16

* 1/2 YEAR

WORK ORDER DISTRIBUTION



PROJECT MANAGEMENT

- PROJECT OFFICE
- PROJECT SUPPORT
- CONFIGURATION MANGEMENT
- QUALITY ASSURANCE
- PUBLICATION SERVICES

SYSTEM ENGINEERING

- TECHNICAL MANAGEMENT
- ANALYSIS
- DESIGN
- TECHNICAL REVIEWS
- TEST AND VERIFICATION PLANS
- OPERATIONS ENGINEERING

HARDWARE ENGINEERING

- TECHNICAL MANAGEMENT
- HARDWARE DESIGN
- PROCUREMENT
- FACILITY PLANNING
- INTEGRATION SUPPORT

SOFTWARE ENGINEERING

- TECHNICAL MANAGEMENT
- SOFTWARE DESIGN
- IMPLEMENTATION AND TEST
- INTEGRATION SUPPORT

INTEGRATION AND TEST

- MANAGE I&T
- SUBSYSTEM TEST AND INTEGRATION
- FACTORY ACCEPTANCE TEST

INSTALLATION CHECKOUT TEST

- SHIPPING PLAN
- PACK AND SHIP
- INSTALLATION AND CHECKOUT
- SITE ACCEPTANCE TEST (SAT)
- TEST REPORT
- DELIVERY DOCUMENTATION

FACTORY TEST BED

- FACILITY PREPARATION
- FACILITY SUPPORT

TRAVEL

- PROJECT MANAGEMENT
- SYSTEM ENGINEERING
- HARDWARE ENGINEERING
- INSTALLATION
- TRAINING

OPERATIONS AND MAINTENANCE

- OPERATIONS, MAINTENANCE & LOGISTICS PLAN
- O&M HQ
- O&M BUREAU
- O&M SPARES

11. PLANS FOR PHASE III