IT8 ACCREDITED STANDARDS COMMITTEE

X3T9.2/91-50

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& CALLED
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FAX LETTER

April 18, 1991

Mr. John B. Lohmeyer
Chair, X3T9.2
NCR Corporation
3718 North Rock Road
Wichita, KS 67226
316/636-8889

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Dear Mr. Lohmeyer:

We have received your notice regarding the formation of a scanner command set working group as part of the SCSI-3 activities. We would like to be kept informed of the activities of that working group, as we expect that we may have common interests.

As Chairman of ANSI IT8 Working Group 14, I am writing to acquaint you with work currently being done to develop an interface specification for color electronic scanners.

Attached, please find some working documents from IT8 WG14. Our goal is to develop a generic data format and command set specification under which SCSI is one potential physical link.

Working Group 14 consists of representatives of major vendors and users in the color prepress arena. As such, we have extensive discussions regarding photometric processing, electronic image processing and color communication aspects of scanners.

We would be very happy to share with your group the requirements of electronic prepress as well as our suggestions for possible solutions. Unfortunately, we will not be able to have a representative at your upcoming meeting. However, we would appreciate receiving any pertinent materials from your discussions.

The next meeting of IT8 WG14 is scheduled for Tuesday and Wednesday mornings, June 11-12, in Las Vegas. We would welcome your attendance at that meeting. A meeting announcement with hotel information will be sent to you in early May.

Sincerely,

Robert Prichard /ma

Robert Prichard
Chair, IT8/TSC/WG14

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COLOR ELECTRONIC PREPRESS SCANNER
DEVICE MODEL

The CEPS/scanner architecture consists of 3 essential components:

a) the "analyzer": the actual input scanning device;

b) the "control station": the intelligence controlling the mechanical, optical and electrical operation of the analyzer. It can range from an embedded microcontroller up to a scanning workstation (including keyboard and display) requiring an operator;

c) a "workstation" or "CEPS system": the final destination of the image data, where they will be further edited, corrected and/or combined into full pages.

In the typical high-end (color trade shop) environment, the control station provides an extensive manual setup for an operator to plan and control input scans. The CEPS handles retouching, montaging and page assembly.

In the typical desktop/mid-range system, the control station is reduced to a scanner embedded controller. The user interface for setup and control of the scanning process is implemented as an application program on the PC or workstation.

The ANSI IT8/WG14 specification concentrates on the interface between a generic "control station" and a generic "workstation/CEPS". The specification will provide for a range of scanner capabilities as mentioned above--from simply taking the scan data from a manually set up scanner, to completely controlling the analyzer via an intelligent scanner controller.

Besides image data and the associated attributes (describing the most important image characteristics such as size, pixel resolution and data encoding), the setup and control information is logically divided in several "groups" corresponding to an increasing scale of "functional capabilities":

- data transfer control
- media setup
- sizing setup
- photometric setup
- (color) image processing setup
- on-line capabilities reporting
- (remote) diagnostics
- job and production management

A Level I scanner will allow the CEPS only to "grab" the image data. All setup and control is handled via an operator control station.

A Level II scanner will allow the CEPS to specify data encoding options and to have some control over the image data flow.

A Level III scanner can effectively be controlled remotely from the workstation/CEPS. For each of the setup/control categories, there will be generally available functions, optional functions (supported to the extent the actual device implementation allows for) and vendor-specific functions.
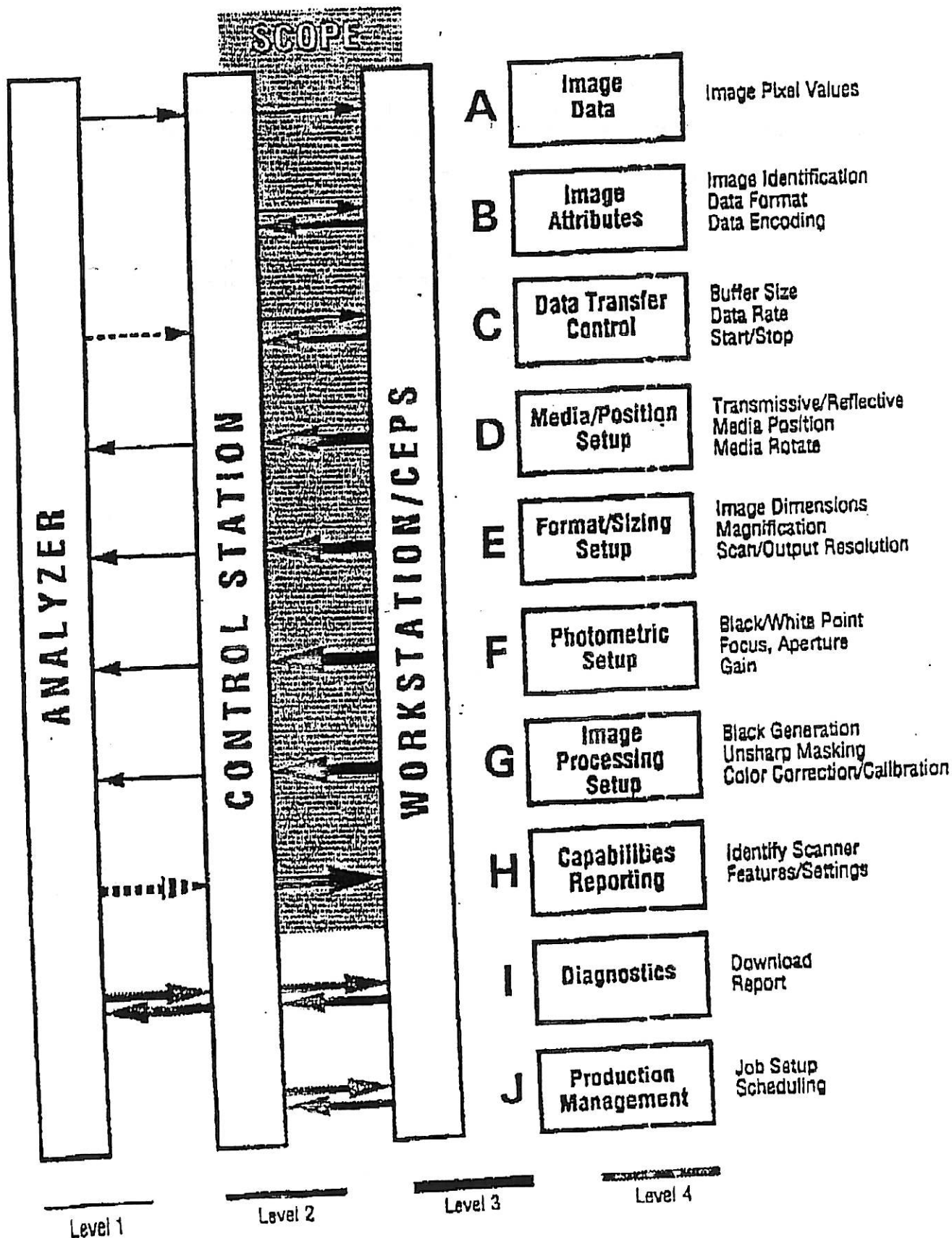
A <u>Level IV</u> scanner allows the interchange of job and production management data between scanner and CEPS (planning, billing, Q A data, etc.), and supports diagnostic and other maintenance procedures remotely from the CEPS.

Under the scope of the specification, diagnostic and production management operations are considered to be vendor specific aspects.

The device model diagram illustrates the functional subsystems, the data/command categories, and the data flows at the different implementation levels. It also lists typical examples of features for each category.

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Color Electronic Prepress Scanner – Device Model

A | Image Data | Image Pixel Values

B | Image Attributes | Image Identification / Data Format / Data Encoding

C | Data Transfer Control | Buffer Size / Data Rate / Start/Stop

D | Media/Position Setup | Transmissive/Reflective / Media Position / Media Rotate

E | Format/Sizing Setup | Image Dimensions / Magnification / Scan/Output Resolution

F | Photometric Setup | Black/White Point / Focus, Aperture / Gain

G | Image Processing Setup | Black Generation / Unsharp Masking / Color Correction/Calibration

H | Capabilities Reporting | Identify Scanner Features/Settings

I | Diagnostics | Download Report

J | Production Management | Job Setup / Scheduling

SCOPE

ANALYZER   CONTROL STATION   WORKSTATION/CEPS

Level 1   Level 2   Level 3   Level 4

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COLOR ELECTRONIC PREPRESS SCANNER
Device Model

A. **IMAGE DATA** (Image Pixel Values)

B. **IMAGE ATTRIBUTES** (Image identification, Data Format, Data Encoding)

1. Scan Data Orientation
   Load Scan Data from top left, horizontally
   Load Scan Data from top left, vertically
   Load Scan Data from bottom left, horizontally
   Load Scan Data from bottom left, vertically
   Load Scan Data from top right, horizontally
   Load Scan Data from top right, vertically
   Load Scan Data from bottom right, horizontally
   Load Scan Data from bottom right, vertically
   Orientation unknown

2. Number of Supported Image Data Types
   Type(s) of Supported Image Data Types

3. Number of Supported Data Compression Formats
   Type(s) of Supported Data Compressions Formats

4. Number of supported Color Interleaving Formats
   Type(s) of supported Color Interleaving Formats

5. Number of Supported Bits Per Sample
   Type(s) of Supported Bits Per Sample
   (Merge 5 and 6 into: Structure of Pixels — Specifies the number of
   samples (colors) per pixel, the number of relevant and padded bits per
   sample and their order and the remaining padding?)

6. Number of Bits Per Sample
   Number of Packed Samples Per Number of Bytes

7. Number of Supported Image File Types
   Type(s) of Supported Image File Type(s)

C. **DATA TRANSFER CONTROL** (Buffer Size, Data Rate, Start/Stop)

1. Scanner Speed Setting Range
   (Minimum, Maximum?)
   Unit of Scanner Speed
   (Scans/second, Revolutions/minute or /second?)

2. Scanner Output Data Rate
   (Minimum and Maximum Rate in kilobytes?)

3. Maximum Data Block Size

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D. MEDIA/POSITION SETUP (Transmissive/Reflective, Media Position, Media Rotate)

1. Transmissive/Reflective Scan Capability
    Specified for each media carrier type, see E-1 below).

2. Image Orientation
    Mirror, Fast Scan, Slow Scan, Both
    Flip, Fast Scan, Slow Scan, Both
    Rotate, clockwise, 90 degree steps

3. Maximum Number of Windows in Scanning Area
    (Are scans sequential, or can they be contiguous? Can parameters be
    stored for multiple sgans? Number of scans that can be executed without
    operator intervention?)

4. Media Scan Carrier Rotation
    Direction and range of Rotation
    Rotation Step Value

5. Media Scan Carrier Translation
    Media Fast-axis Translate Minimum/Maximum Range
    Media Fast-axis Translate Unit of Measurement
    Media Fast-axis Translate Unit of Measurement Step Value
    Media Slow-axis Translate Minimum/Maximum Range
    Media Slow-axis Translate Unit of Measurement
    Media Slow-axis Translate Unit of Measurement Step Value

E. FORMAT/SIZING SETUP (Image Dimensions, Magnification, Scan/Output Resolution)

1. Number of Media Scan Carrier Types (specified largest to smallest)
    Carrier Minimum Magnification for Fast-axis Scan Carrier Type N
    Carrier Minimum Magnification for Slow-axis Scan Carrier Type N
    Carrier Maximum Magnification for Fast-axis Scan Carrier Type N
    Carrier Maximum Magnification for Slow-axis Scan Carrier Type N
    Magnification Unit of Measurement
    Magnification Unit of Measurement Step Value

2. Scan Area For Media Scan Carrier Types (need to specify fast/slow scan
    length for both transmissive and reflective if applicable)
    Maximum Scan Length for Scan Carrier Type N Fast-axis
    Maximum Scan Length for Scan Carrier Type N Slow-axis
    Scan Length Unit of Measurement
    Scan Length Unit of Measurement Step Value

3. Number of Supported Fast-axis Input Resolutions
    (Specify each resolution)
    Number of Supported Slow-axis Input Resolutions
    (Specify each resolution)
    Fast-axis Resolutions
    Slow-axis Resolutions
    Resolution Unit of Measurement

4. Required Output Resolutions
    (Specify range of resolutions, or percent)

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