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A travel back in the history of
the CD

First Audio Disc Produced

- 1948 was the first developed audio disc
- 1960 first audio disc introduced to market
- 1967 first digitally recorded disc introduced by Phillips (Polygram) and Sony/CBS
- 1982 first production audio CD disc introduced again by Phillips and Sony/CBS

Evolution began in the data storage media

- It all started in the mid 1970's with data storage in various forms
- IBM 8 " than 5" floppy disc & 3-1/4"
- 3-1/2 " encased floppy disc
- ZIP Drives
- CD Audio
- CD ROM
- DVD
- HD-Blu Ray

Anyone remember these

- Anyone in this room that remembers these and used them certainly don't need to be here.
- You're one of the pioneers of this trade!!

Created 1967 by IBM San Jose ,CA
8" format 80 KB storage

1976 IBM 5 1/4 " discs 360 Kb

At the end of 1982 the first
production audio disc was
introduced.

Billy Joel's "Nylon Curtain"

Second was

Simon & Garfunkel's

Bridge Over Troubled Waters

122 titles were sold that year-
20,000 discs and a small
amount of players

By 1987 there were 200 titles
sold and over 100 million discs
along with 9000 players

Disc costs \$ 16.95 and players
were \$ 1000.00

New Developments for storage Data Discs

- 1982 Microsoft enters software market
- Need for higher storage capacity is needed. Current floppy discs need more capacity. Multiple discs required to store data
- 1988 Phillips/Sony introduce first CDR's
- The race for disc capacity is on competing for production

Introduction of the DVD

- 1993 Phillips-Sony-Toshiba-Time Warner-Matshushita Electric-Thomson all introduce DVD's to their market
- Next year DVD-R/- introduced
- 2003 Sony introduces Blu Ray player
- 2003 HD players also introduced
- 2006 Blu Ray-HD discs introduced in Games while HD directs toward movies
- 2008 Industry leans toward Blu Ray technology

Two distinct markets yet all require some form of decorating

- Data Storage & Audio
- Floppy discs
- ZIP drives
- CD's
- CD ROM
- DVD-R+/-
- Optical discs
- VHS
- CD's
- DVD
- HD
- Blu Ray

OK Where do we go from here

- Over the last 25 years these innovations in new technology have demanded higher quality and performance to satisfy the consumer and the recording artist.
- Greater graphics-higher player speeds-higher production-more information in smaller package
- The evolution begins

Decorating in the Optical Disc Market

- Late 1970's –early 1980's were paper labels with hand written legends
- 1980"s began with pad printing for both medias
- 1981 started screen printing floppy disc. Kammann actually first screen printer was from a floppy disc application. Plates
- 1983 Kammann introduces screen printing CD's
- 1985 Kammann introduces offset printing K15-O
- 1987 Kammann introduces K15.I multi color screen printer
- 1998 Kammann introduces K15-40 offset printer . The most recognized and accepted printer for DVD's
- 2000 Kammann introduces the K15-50 Digital printer with Indigo engine
- 2006 Kammann introduces the 1204 D Digital printer

Now enters CD's for the Optical Disc Market

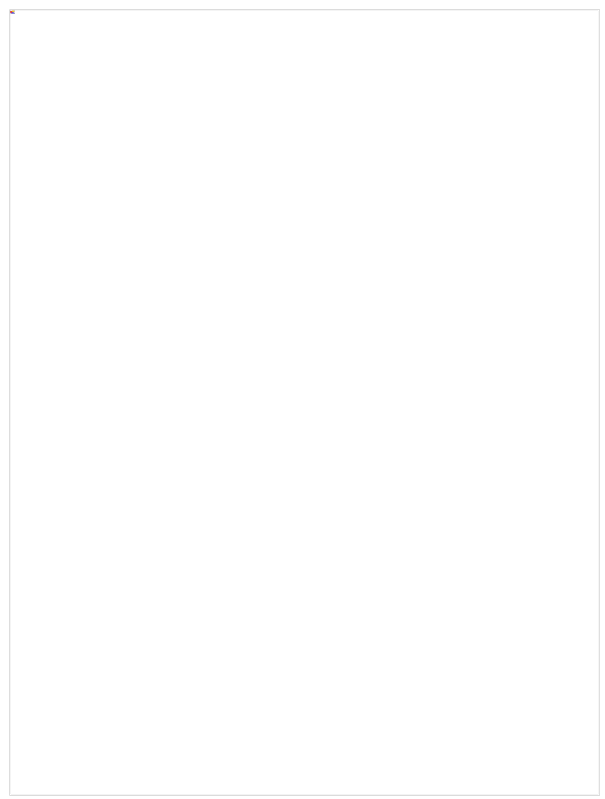
- Various forms of equipment to meet demands

Evolution in progress

- From scripto to Digital in 25 years
- Pad printing
- Screen Printing UV system
- Flexographic
- Thermal adhesive films
- Screen/ Offset
- Digital
- We tried it all

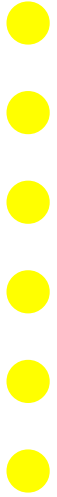
Scripto Marker Era
one coat white cover
CDR

Text printing on CDR's with screen
print one color 1988

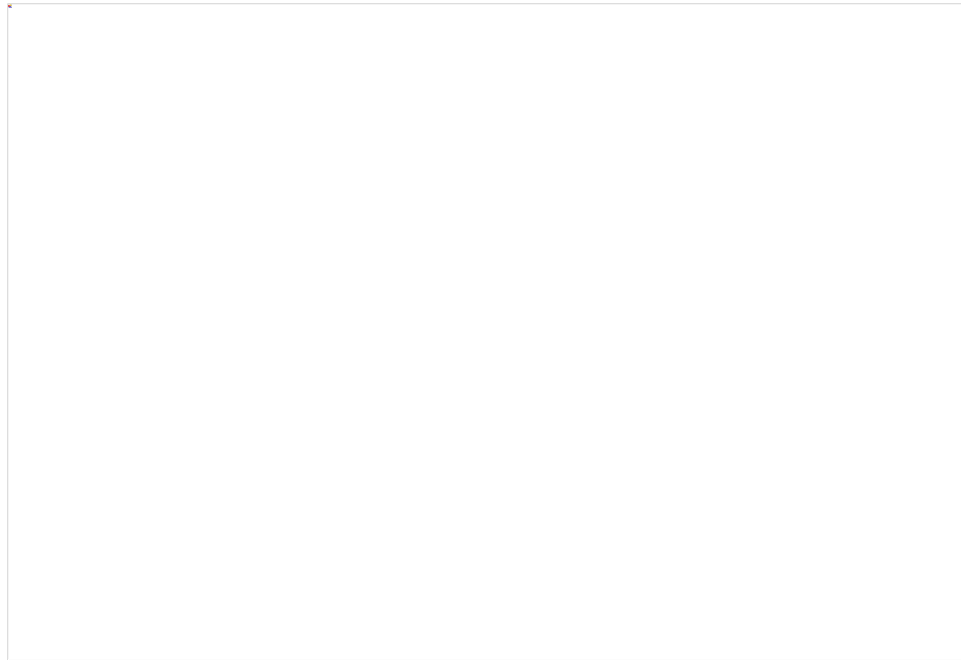


K26-O High Speed CTP Imager

- Native Resolution 2400DPI
- Screens up to 200LPI
- Full gray scale output
- Dot size controlled at 15 microns
- Output 6-8 four color jobs per hour
- Windows 2000 OS
- Dual Mandrel setup fast exposure
- Very low cycle time 1-1/2 -2 minutes
- State of art RIP Software
- Inexpensive plates



Commercial software for design



Components that add to quality

- Ident check cameras-checks for correct discs in system
- Print check cameras-confirms print quality and free of contaminants such as dust particles
- Read Side cameras-confirms read side free of scratches and mold imperfections
- Security read cameras- identify water marks
- Embedded recognition cameras- confirm security chips are in place and activated

Change does not occur overnight.
20 years in development and still
the demands are for higher speeds
, less expensive production , and
compact footprint.

Blu Ray versus HD versus other methods

- Blu Ray - HD
- Games
- Movies
- Home video
- Internet downloads
- Memory sticks

