

SID
North West Chapter

***How to Resize LCDs
for Fun and Profit***

By

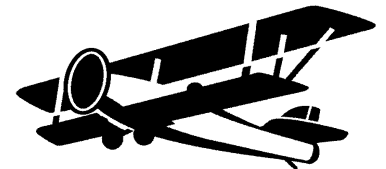
Lawrence E Tannas, Jr.

President

Tannas Electronic Displays, Inc.

Orange, California, USA

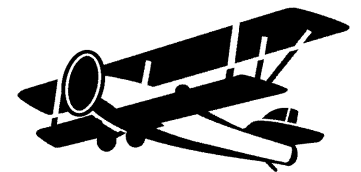
13 November 2013



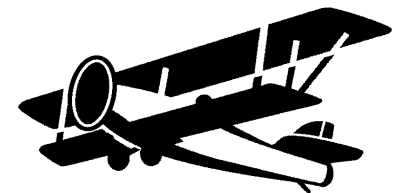
Resizing
an
LCD Enabler

Presentation Outline

- Resizing Design Rules
- Qualification Testing
- Size and Shape Options
- Serving Two Applications
- Summary of Patents
- *Offering Prototypes,
License & Machinery*

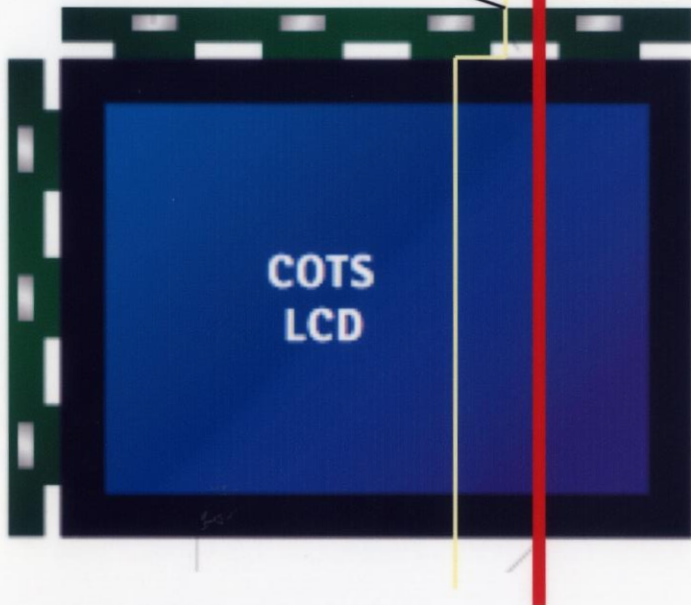


Resizing Design Rules

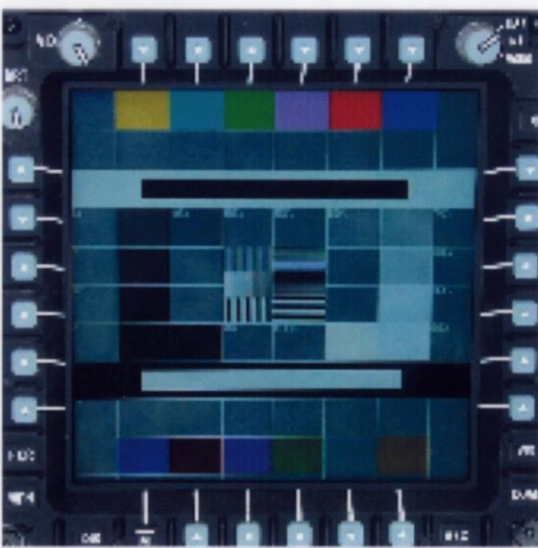
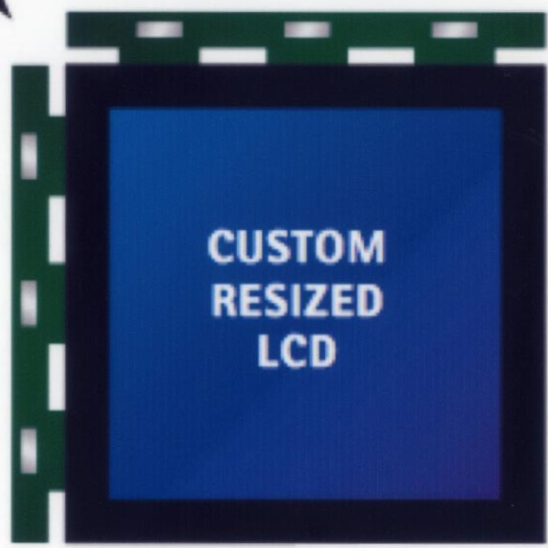


Alternate Cut Line

Cut Line



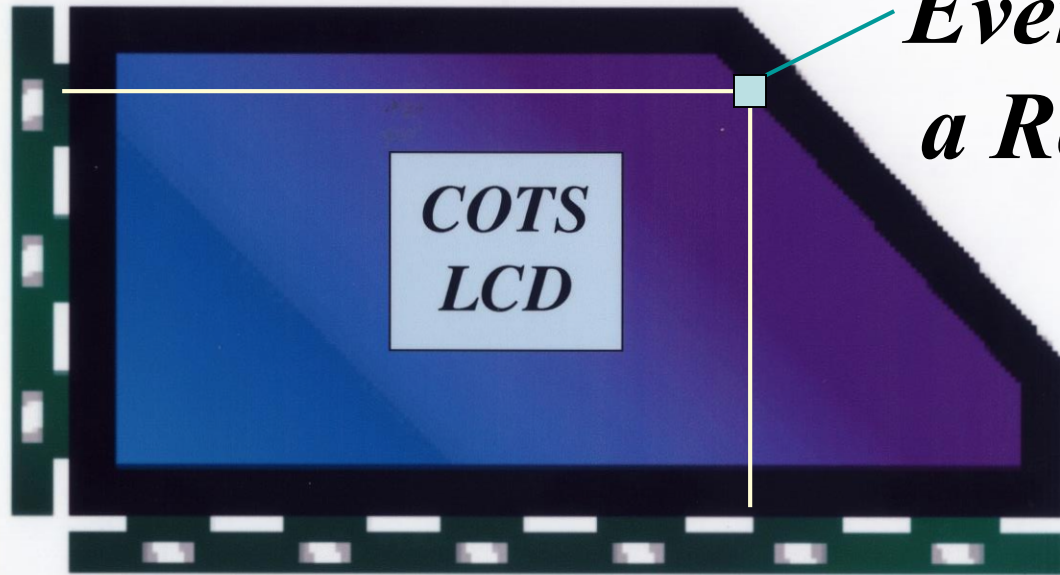
Disassemble
Cut Circuit
Cut Glass
Reseal & Test



*Cut
Between
TAB Chips*



Odd Sizes and Shapes



*Every Pixel Needs
a Row & Column
Driver*



Only the Size Changes

- Cut off end of electronic shift register:
- Cut glass away from image start point:

Electrical interface stays the same

Only the Size Changes

- Cut off end of electronic shift register:
- Cut glass away from image start point:

Electrical interface stays the same

Optical properties stay the same

Only the Size Changes

- Cut off end of electronic shift register:
- Cut glass away from image start point:

Electrical interface stays the same

Optical properties stay the same

Image resolution stays the same

Only the Size Changes

- Cut off end of electronic shift register:
- Cut glass away from image start point:

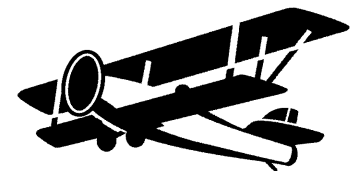
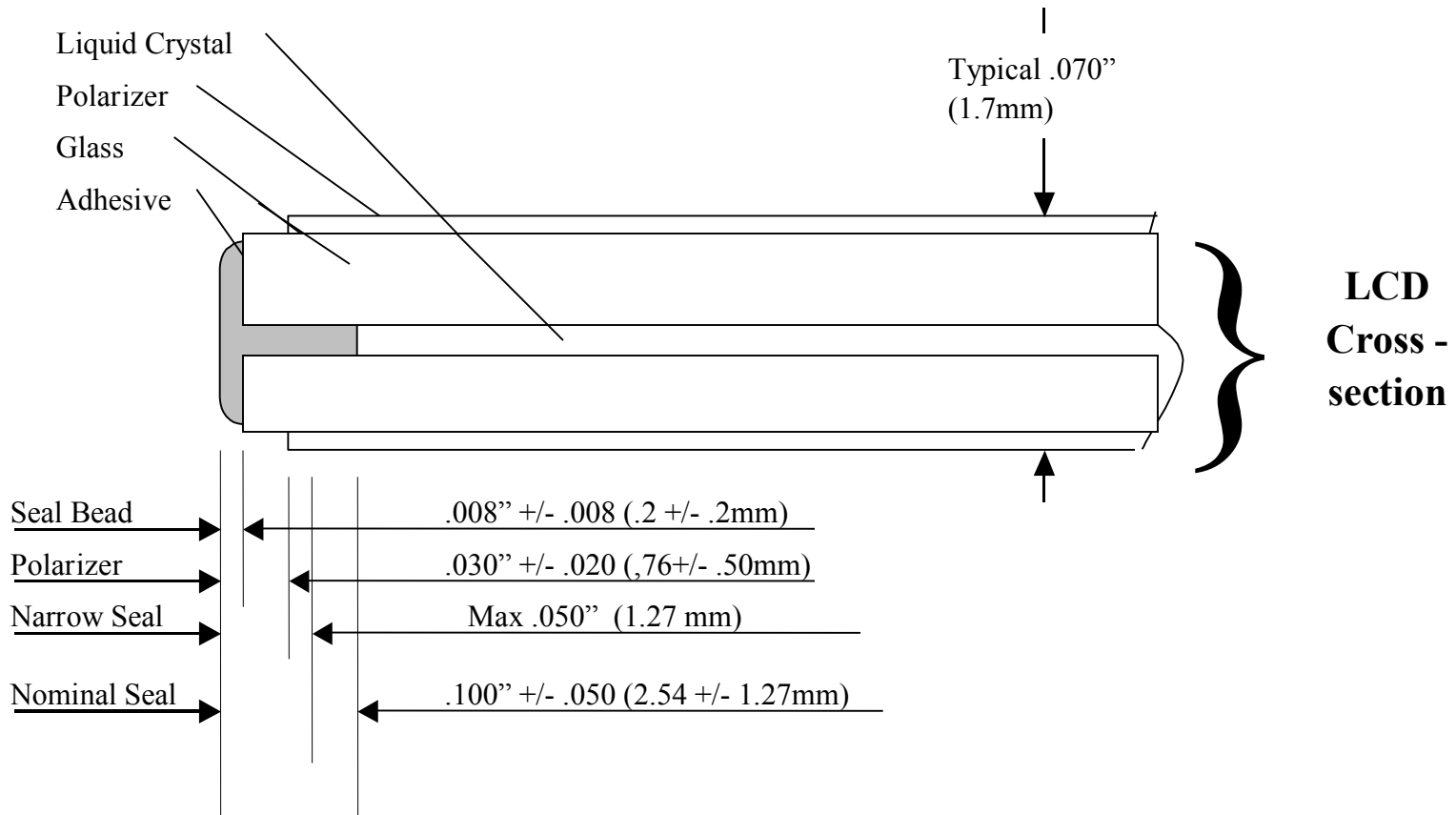
Electrical interface stays the same

Optical properties stay the same

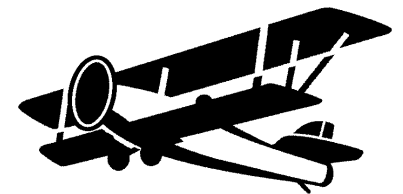
Image resolution stays the same

Environmental capability does not change

TANNAS-SIZED™ LCD Seal Details

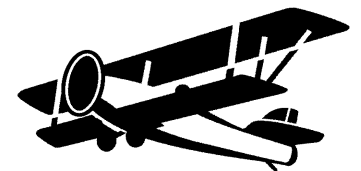


Qualification Testing



Qualification Testing

- BAE Systems - Military Electronics
- GD Canada – Vehicle Electronics
- Interface Displays & Controls, Inc., Avionics
- TED - ARINC Commercial Avionics
- TED - Boiling Water to Dry Ice 10 times
- TED - Life Test five years



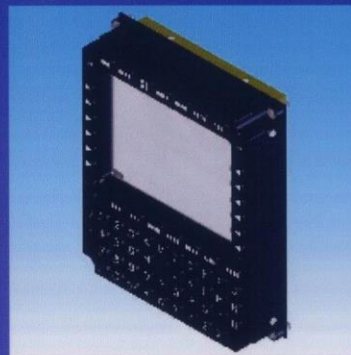
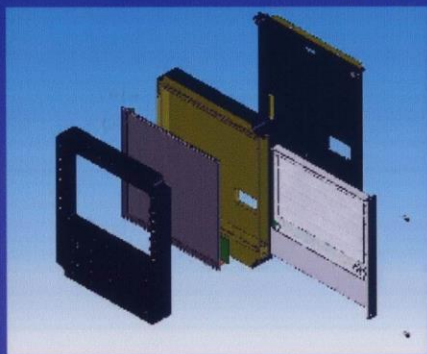
Validation of resized commercial AMLCD technology for cockpit avionics

Priya Bendale, Ph.D.
Interface Displays & Controls, Inc
Oceanside, CA 92056



Display head assembly

- ◆ Laminated Display and backlight (CCFL) assembly integrated into modular head (minimum passive enhancement used)
 - Integrated within existing ARINC 739 Cockpit display unit design (minimize cost)

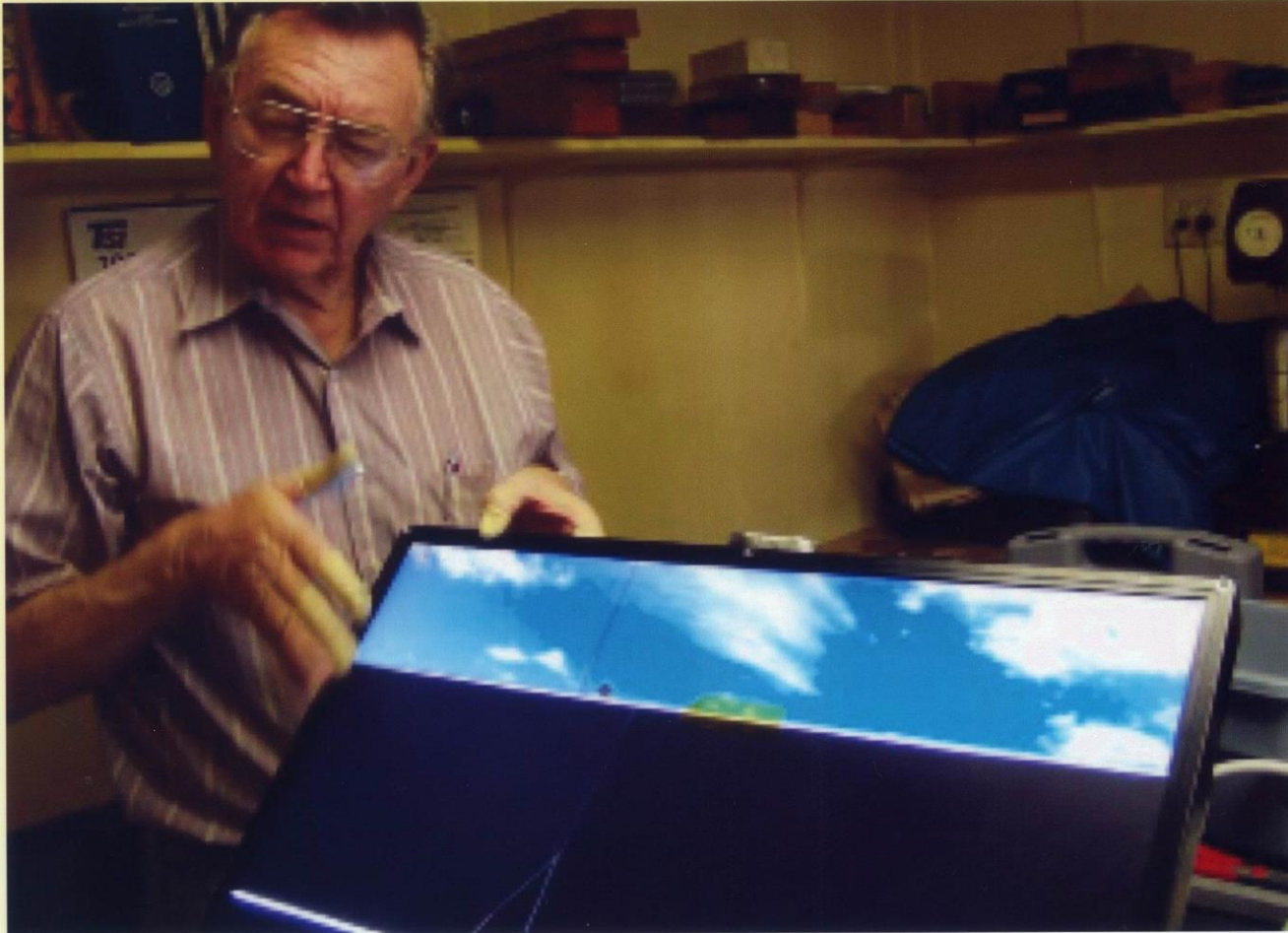


TANNAS-SIZED™ LCD 5" x 5"



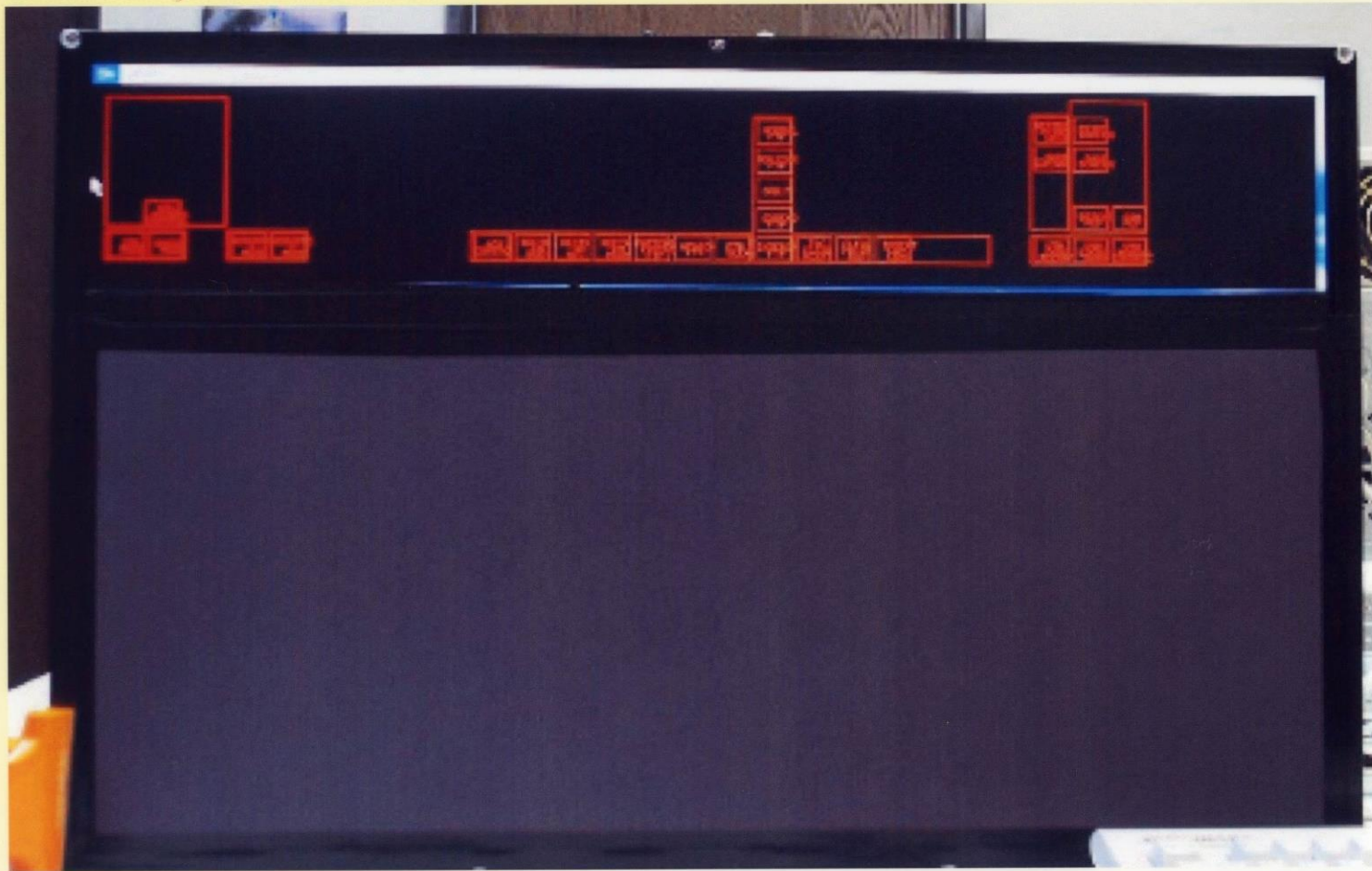


Tactical Displays, Inc

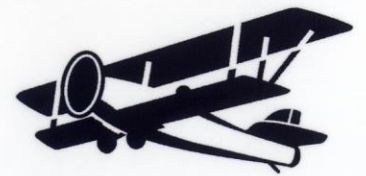




Tactical Displays, Inc



Replace Plasma Panel



Serving Two Applications

- *Digital Signage*
- *Aerospace and Industrial*

Digital Signage Applications

Large Sizes

Large Volume

Stretch or Bar Type

(Excluding Aerospace Applications)



Digital Signage: a New Paradigm

DSE
Annual Show
Las Vegas



6호선 노선도



이 칸은 6호선 환승역의 상징인 '행복,입니다' 6호선을 이용하시는 고객 여러분의 '행복,을 늘립니다' 5678 고객센터 전화/문자 1577-5678



A digital display above the train doors provides route information. It features a blue background with a map on the left. The text reads: "NEXT STOP: LADY BIRD MEMORIAL PARK" in white. Below this is the McDonald's logo and the text "McDonald's". To the right, it says "SEPT 6TH" and "12:04PM".

Simulated

12(Tue) ▶ 15(Fri)



Korea
Electronics
Grand Fair 2010

KES
www.kes.org

ISEDEX
www.isedex.org

iMiD
www.imidex.org

October 12(Tue) ▶ 15(Fri)

등록카드 작성
Form Filling-out Counter

작성하신 분은 현장등록대에서 출입증을 받으세요
Please pick up your badge at on-site registration

등록카드 작성
Form Filling-out Counter

Simulated



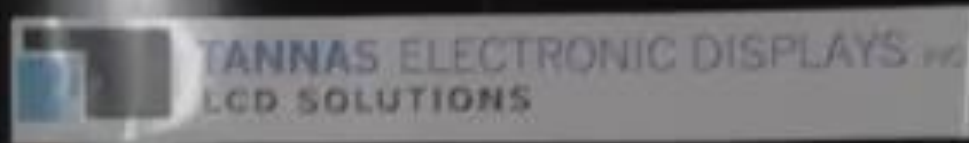
FORGET REPAILING.
WE'LL DO IT FOR YOU

FORGET REPAILING.
WE'LL DO IT FOR YOU

HERTZ SH

Hertz Local Maps

Resized AUO 65" LCD



Aerospace and Industrial Applications

Small Sizes

Small Volume

Highly Customized

Definition

Aerospace and Industrial industries in which

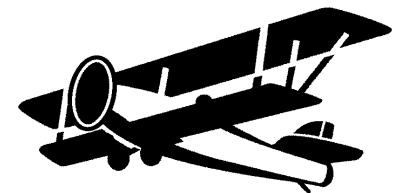
resized displays are used

By

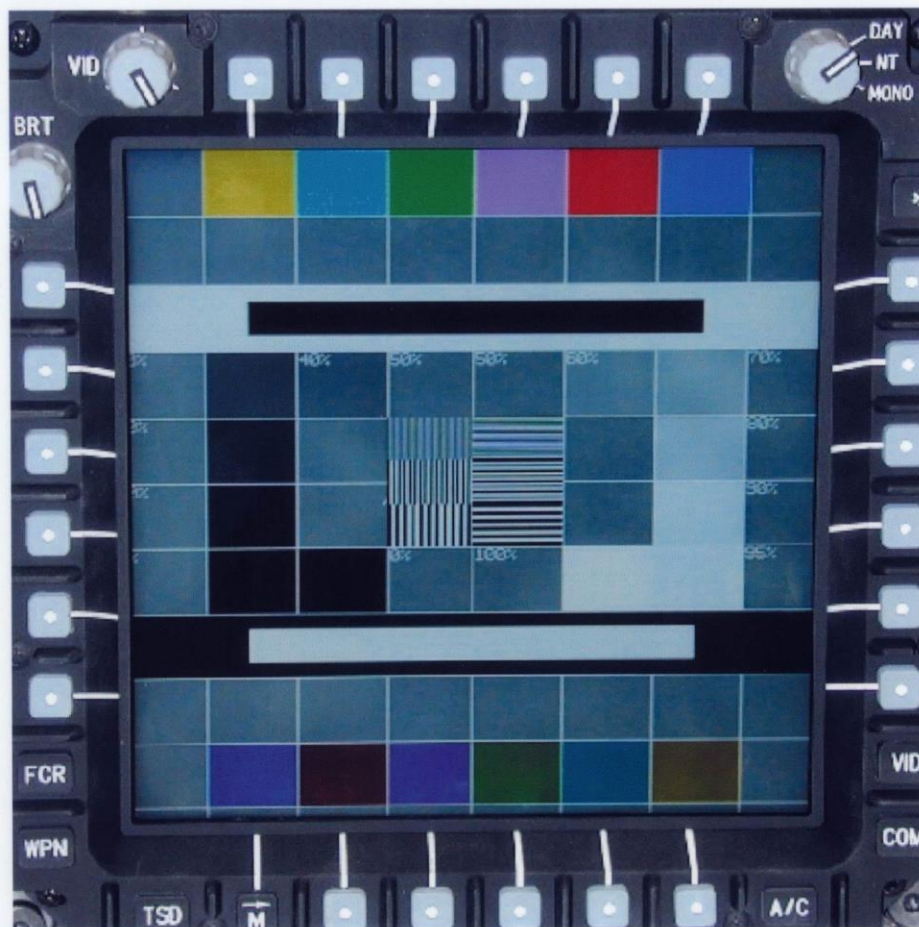
trained, in-training, and/or licensed operators

**to control and/or monitor the performance
of a computer, machine, system, device,
and/or process in real time.**

“SKILLED USES”



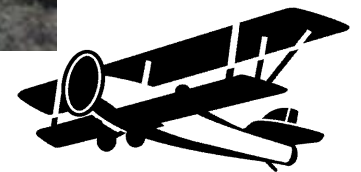
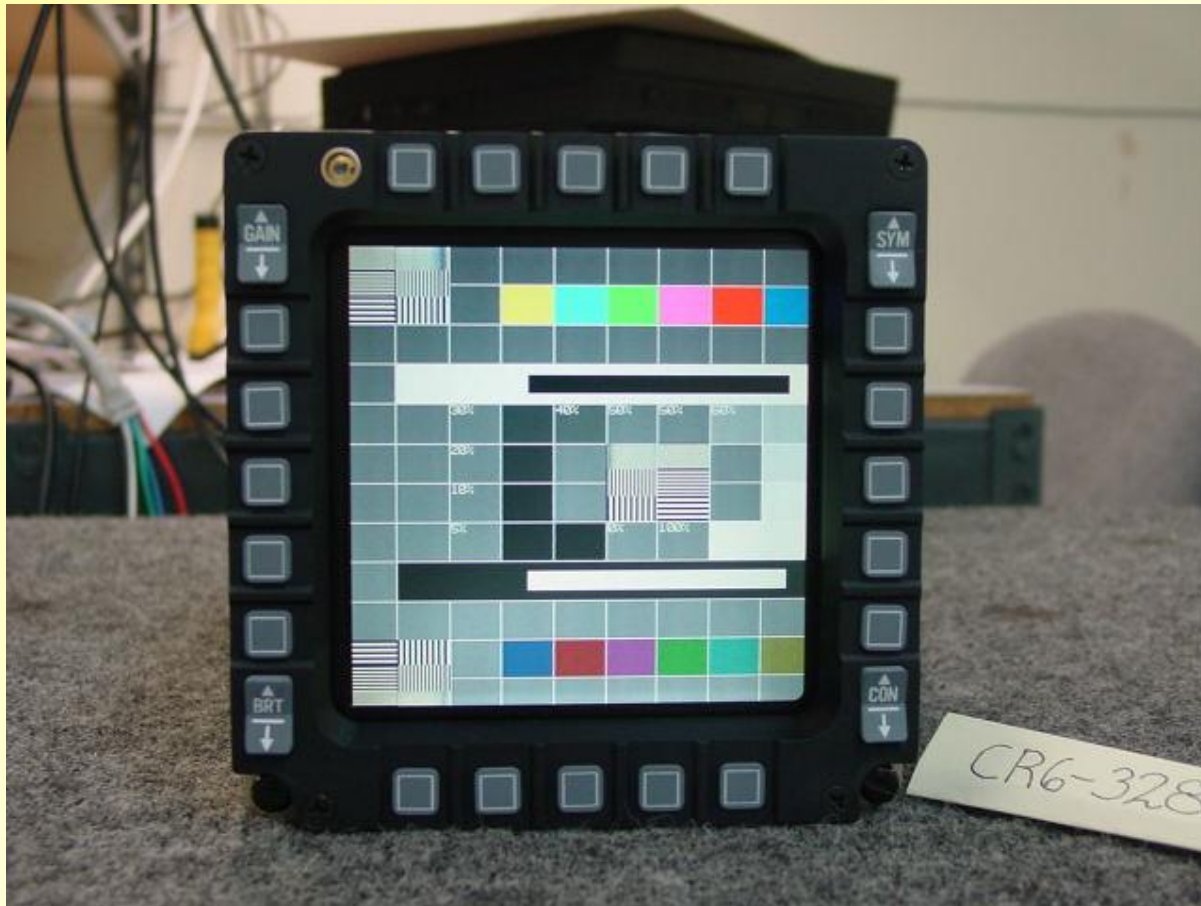
Licensee: Symbolic Displays, Inc.



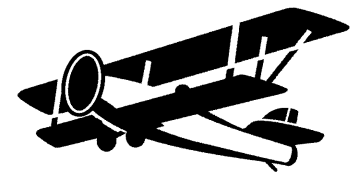
Apache Longbow Multipurpose Displays designed and manufactured by Symbolic Displays, Inc.
(6" x 6")



Aerospace Licensee: SGB Enterprises, Inc.



F-35 Simulator Display Made by Driven Technology Using TANNAS-SIZED™ LCD Made from 2 Resized 8"x10" = 8"x20" with .1" mullion





RESIZING LCDs FOR CUSTOM APPLICATIONS

LCDs to Fit Just About Anywhere!

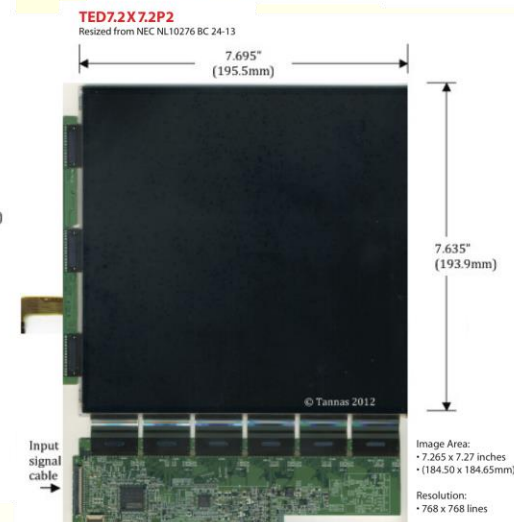
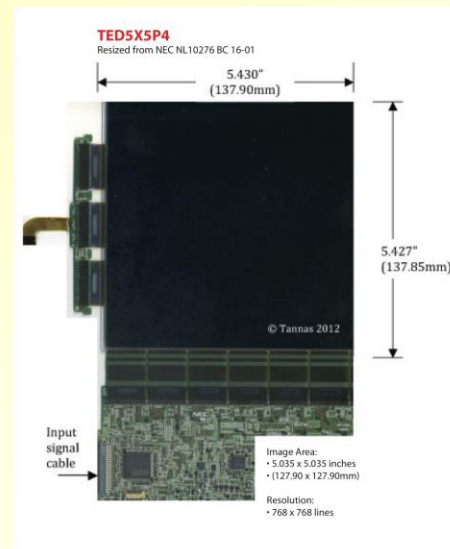
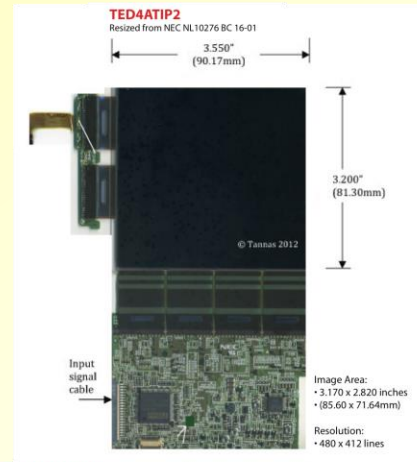
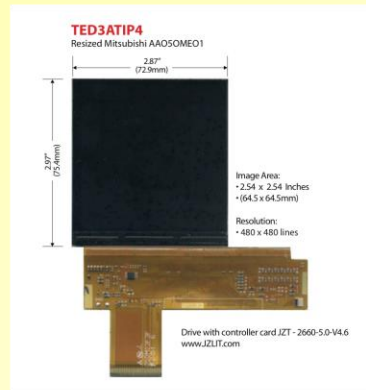
The resizing process has a high yield and is cost effective. Performance and reliability of the original display are preserved.

TED (Tannas Electronic Displays, INC.)

LCD GLASS RESIZING SERVICE FOR INDUSTRY WORLDWIDE

Licensors / Proprietor, Orange, California, USA

Contact: Larry Tannas, PHONE: 1 714 633 7874 / CELL: 1 714 342 7067 / L.tannas@tannas.com / www.tannas.com

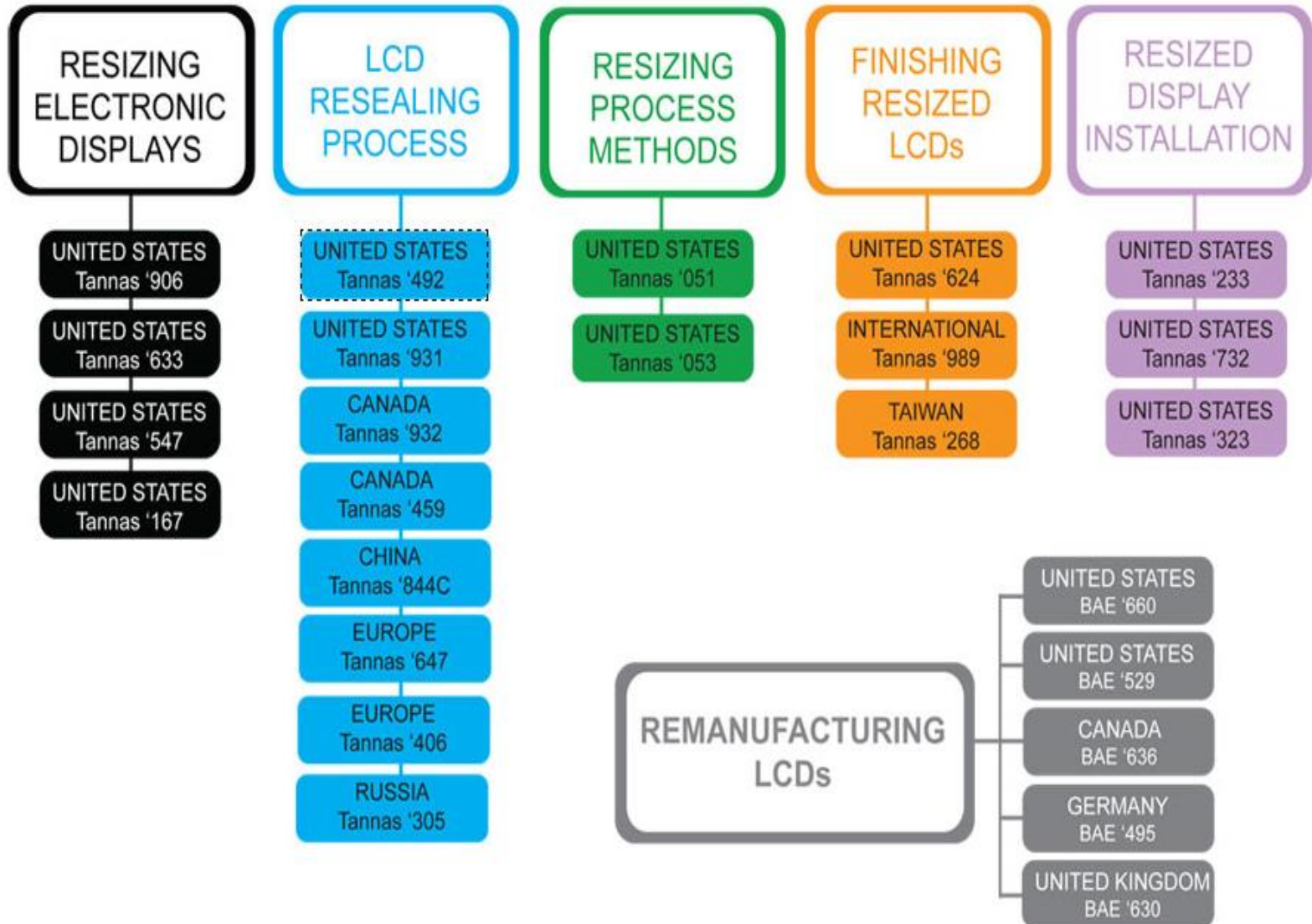


Summary of Patents

- BAE has several patents for resizing & Tannas has rights to Use and Sublicense World Wide.
- Tannas has patents for method of getting seal between the plates in US, Canada, Europe, China and Russia.
- Tannas has patents pending for advanced methods for resizing displays World Wide.

Patents Available for Licensing

As of 13.OCT.2011



TED Offers Resizing Technology:

- 1 Resize LCDs up to 65”**
- 2 License Technology**
- 3 Sell Cut & Seal Machinery**

Sell Cut & Seal Machinery to Licensee

- Machinery for development & prototyping
 - Aerospace Volume, 1 to 10 / hour
- Up to 65” diagonal LCD size
- Cutting and sealing capability

Custom Machine for Resizing LCDs Using TED Patented Process

www.tannas.com



Demonstrations Available

- Must be interested in becoming a licensee
- Deposit of \$10K needed
- Refundable \$5K
- Completed in ½ Day period
- Demonstration using 46” LCD for bar type LCD

New Ad

Licensees
9 Signage
1 Aerospace



RESIZING LCDs FOR CUSTOM APPLICATIONS

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The resizing process has a high yield and is cost effective. Performance and reliability of the original display are preserved.

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l.tannas@tannas.com, www.tannas.com

LICENSEES FOR DIGITAL SIGNAGE APPLICATIONS

ADITECH Fluessigkristallanzeigen GmbH

Heidenheim, Germany
Contact: Mrs. Doerte Holz
Phone: +49 7321 9842 28
Fax: +49 7321 9842 20
doerte.holz@aditech-lcd.de
www.aditech-lcd.de

ANNAX Anzeigesysteme GmbH

Munich, Germany
Contact: Wolfgang Elbert
Wolfgang.elbert@annax.de
PHONE: +49 89 614 436 30
www.annax.com

BMG MIS (Formerly AEG MIS)

Ulm/Germany
Contact: Otto Bader
PHONE: +49 731 59099 203
FAX: +49 731 59099 49 203
otto.bader@bmgmis.de
www.bmgmis.de

GSD CO., LTD

Gumi-city, Gyeongbuk, Korea
Contact: Daniel Chae, Ex VP
PHONE: +82 54 461 7188
FAX: +82 54 461 7190
cys@wgsd.co.kr
www.wgsd.co.kr

LITEMAX Electronics Inc.

Shin-dian City, Taiwan
Contact: David King
PHONE: +886 2 89191858
FAX: +886 2 89191300
davidking@litemax.com
www.litemax.com

MRI (Manufacturing Resources International, Inc.)

Atlanta, Georgia, USA
Contacts: Bill Dunn, bdunn@mri-inc.net,
Peter Kaszycki, pkaszycki@mri-inc.net
PHONE: 1 770 295 1201
www.mri-inc.net/sub-contact.asp

LICENSEES FOR AEROSPACE AND INDUSTRIAL DISPLAY

SDI (Symbolic Displays, Inc.)

Santa Ana, California, USA
Contact: Tony Lopez, Director of Sales,
PHONE: 1 714 258 2811 (x105)
tonyl@symbolicdisplays.com, www.symbolicdisplays.com



Digital Signage Atop Taxi

STI Co., Ltd. (Systems Technology, Inc.)

Anseong-City, Gyeonggi-Do, 456-824, Korea
Proven in-house resizing facilities
Contact: Yong-Seok Jin, Sales Manager,
PHONE: +82 31 205 4844 (x2282)
jysist@stinc.co.kr, www.stinc.co.kr

TOVIS Co., Ltd

7-10 Songdo-dong, Yeonsu-Gu, Incheon, 406840, Korea
Contact: Young Hong Kim, Ex VP/COO,
PHONE: +82 32 712 5102
yhkim@tovism.com

VitroLight Technology Co. LTD

Shanghai, China
Contact: Jianbo Wu,
PHONE: +86 21 1364 4132,
FAX: +86 21 5186 1793
jianbo.wu@vitrolight.com
www.vitrolight.com



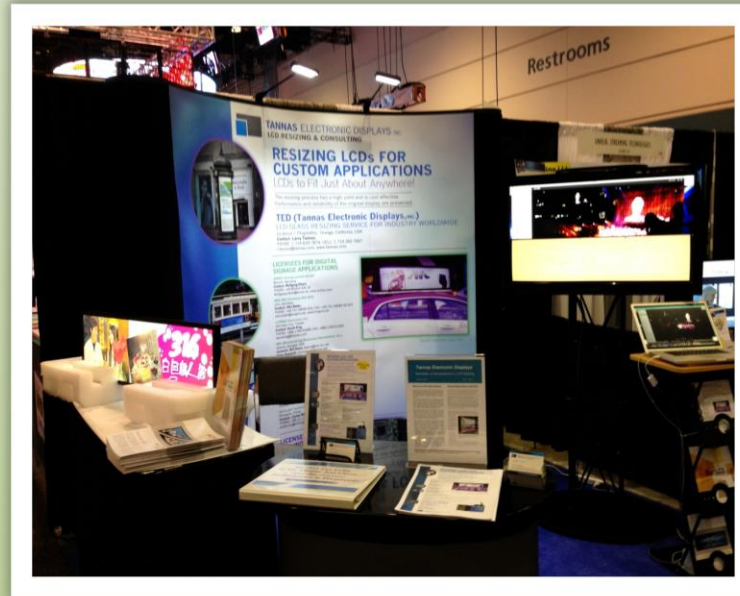
Aerospace / 4 ATI

June 27, 2013

Displays on Exhibition

By Larry Tannas

**I/ITSEC
DSE
InfoComm
SID 2014**



TED For Sale

Age 77

Sell in 3 Years





***THANK YOU
FOR YOUR
INTEREST***