



## **Technical Service Bulletin 040402**

### **IOX-DCX Maintenance Manual**

This service bulletin provides instructions on how to construct your own IOX-DCX Maintenance Manual. The following pages contain a front cover page, rear cover page, title page, table of contents, and a binder spine label. A brief introductory chapter explaining the structure and philosophy of the manual is also included.

When these elements are combined with a 2-1/2" three-ring binder and chapter dividers you supply, the result is an attractive maintenance manual to complement the instruction manual set originally provided with your transmitter.

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Attn: Customer Service

A grayscale background image of a Thomson transmitter rack. The rack is a tall, vertical metal cabinet with multiple bays. On the right side, there is a control panel with a small screen and several buttons. The text "IOX® / DCX® SERIES" and "UHF-TV TRANSMITTER" is overlaid in large, bold, black letters across the center of the image. The text "MAINTENANCE MANUAL" is overlaid at the bottom in a similar font. The rack itself has some labels, including "TRADE" and "V1".

**IOX<sup>®</sup> / DCX<sup>®</sup> SERIES**  
**UHF-TV TRANSMITTER**

**MAINTENANCE MANUAL**

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Manufactured in the United States of America



IOX® / DCX® Series UHF-TV Transmitter  
Maintenance Manual

Table of Contents

INTRODUCTION

1. IOX and DCX Performance Pyramids (procedural bulletins)

030523	Setup of IOX Video Processing
030524	Adjustment of IOT Filaments
030525	Adjustment of IOT Bias Voltage and Idle Current
030527	IOX Carrier Frequency Measurement and Adjustment
030528	IOX Tuning with Sideband Adapter
030529	Calibrate HPA Forward and Reverse Power Meters
030530	Calibrate IOX system Forward and Reverse Power Meters
030531	IOX AGC Setup Procedure
030601	Adjustment of IOX Aural Carrier Power
030602	Adjustment of IOX LF Linearity, ICPM, (Intermodulation) Precorrection circuits
030603	Adjustment of IOX Differential Gain and differential Phase Precorrection circuits
030604	Adjustment of IOC B3 ICPM and Aural Carrier Correction Circuits
030605	Adjustment of Crowbar Filament Voltage
030606	IOX/DCX Interlock Check Procedure
030607	Calibration of IOX HPA Drive Power Meter
030608	Calibration of IOX/DCX Grid Voltage and Current Meters
030609	Calibration of IOX/DCX Ion Voltage and Current Meters
030610	Calibration of IOX/DCX Body Current Meter
030611	Calibration of IOX/DCX Beam Voltage and Current Meters



IOX® / DCX® Series UHF-TV Transmitter  
Maintenance Manual

- 030612 Calibration of IOX/DCX Focus Voltage and Current Meters
  - 030615 IOT Tuning with Network Analyzer or Tracking Generator
  - 030616 Calibration of DCX HPA Power Meters
  - 030617 Calibration of DCX System Power Meters
  - 030624 DCX AGC Setup Procedure
  - 030626 Recommended NTSC Test Equipment Setup
  - 030629 Cooling System Flush Procedure
  - 030633 ADAPT Frequency Adjustment
  - 040125 ADAPT Exciter AGC Setup: DCX and Advantage
  - 040126 Advanced ADAPT Correction Procedure
  - 040503 Emergency PLC Bypass Procedure
  - 040704 IOX/DCX HPA Controller Backplane Replacement
  - 040705 Periodic Flow Meter Testing Alert
  - 040831 Troubleshooting Crowbar Events: IOX/DCX
  - 940911 High Voltage Safety Guidelines
  - 990611 Periodic Crowbar Testing
- 
- 2. 030328 IOX/DCX Troubleshooting Table

3. Other Service Bulletins



IOX® / DCX® Series UHF-TV Transmitter

Maintenance Manual

## INTRODUCTION

This manual provides extensive information and procedures on the maintenance of Thomson IOX and DCX transmitters. It is a compilation of individual service bulletins and troubleshooting tables released and maintained by Thomson Broadcast and Multimedia. Because this information is periodically subject to updates and revisions, the modular construction of this manual allows individual bulletins to be replaced, as needed. A version code and date at the bottom of each bulletin permits easy verification of its revision status.

Updated bulletins may be obtained by contacting Thomson Customer Service at 1-800-345-9295 or by visiting our download site at <http://csg.us.thales-bm.com>.

The manual contains three principal sections:

1. The IOX and DCX Performance Pyramids
  - The first section contains the main body of service bulletins addressing IOX and DCX maintenance procedures. All bulletins are each numbered for referencing and identification. A logical pyramid diagram shows the interrelation of one bulletin to another.
2. The IOX/DCX Troubleshooting Table (030328)
  - The IOX/DCX Troubleshooting Table (030328) provides vital information for the rapid diagnosis of various fault conditions. The table attempts to be encyclopedic in nature, covering a wide variety of problems seen in the field -- from the widespread and relatively benign to the extremely rare and serious. All IOX and DCX users are strongly encouraged to skim the table periodically and be familiar with its contents before a fault condition occurs. The table is frequently updated with information supplied by customers, field service engineers, and the Thomson Customer Service Department.
3. Other Service Bulletins (section for collecting any other pertinent service bulletins)
  - Thomson frequently issues service bulletins addressing product upgrades or other technical information of which the customer should be aware. The final section of this manual provides a location to store those service bulletins that do not belong to the core of procedural bulletins contained in section 1.



IOX® / DCX® Series UHF-TV Transmitter  
Maintenance Manual

*INSERT CHAPTER DIVIDER 1 HERE and DISCARD THIS PAGE*



IOX® / DCX® Series UHF-TV Transmitter

Maintenance Manual

## 1. IOX and DCX Performance Pyramids

The main section of this manual is based on a "performance pyramid" concept. The IOX performance pyramid is shown in Figure 1 on the following page. The pyramid shows the relational interdependence between the various procedures contained in this section. The numbers in parenthesis indicate the service bulletin addressing the procedure described.

As in the case of a real pyramid, the stability of the upper levels depends on the levels below. Accordingly, as per Figure 1, the filament, body, focus, bias, etc. meters should be properly calibrated before the high voltage is activated and the crowbar test fired; the crowbar should be successfully test fired before the high voltage is connected to the tube and the idle current adjusted; the idle current should be correctly adjusted before IOT tuning is attempted, and so forth.

By starting at the lowest levels of the pyramid and climbing progressively upwards, it possible to perform a complete verification of the entire transmitter, as was done when the transmitter was originally commissioned. When used in this manner, the pyramid can serve as a suggested procedure for a yearly transmitter check-up.

During routine maintenance periods, the pyramid alerts the reader to possible consequences from making a given adjustment. Generally speaking, an adjustment at a lower level in the pyramid may require that many or all of the levels above it be readjusted (e.g. a change in the aural power ratio may dictate a readjustment of the linearity & ICPM correctors, differential phase & gain correctors, and aural carrier & B3 ICPM correctors).

The performance pyramid for the DCX series of ATSC transmitter is contained in Figure 2.

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**WARNING:** A television transmitter is a complex piece of telecommunications equipment. Only properly qualified personnel should attempt any of the procedures contained in this manual. Users should fully read and understand the intent and theory of **all** of the procedures contained in this manual, and the general principles of operation of the entire transmitter, before attempting to make any adjustments.

Additionally, users should ensure that they have the required test equipment and/or tools to complete a procedure before starting. IOX customers should consult Service Bulletin 030626 for a list of recommended NTSC test equipment.

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**DANGER:** The IOX/DCX series of transmitters employ potentially lethal high voltage. Proper high voltage safety precautions should be employed at all times when performing the procedures contained in this manual. Please consult Service Bulletin 940911 for more details.

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Maintenance Manual

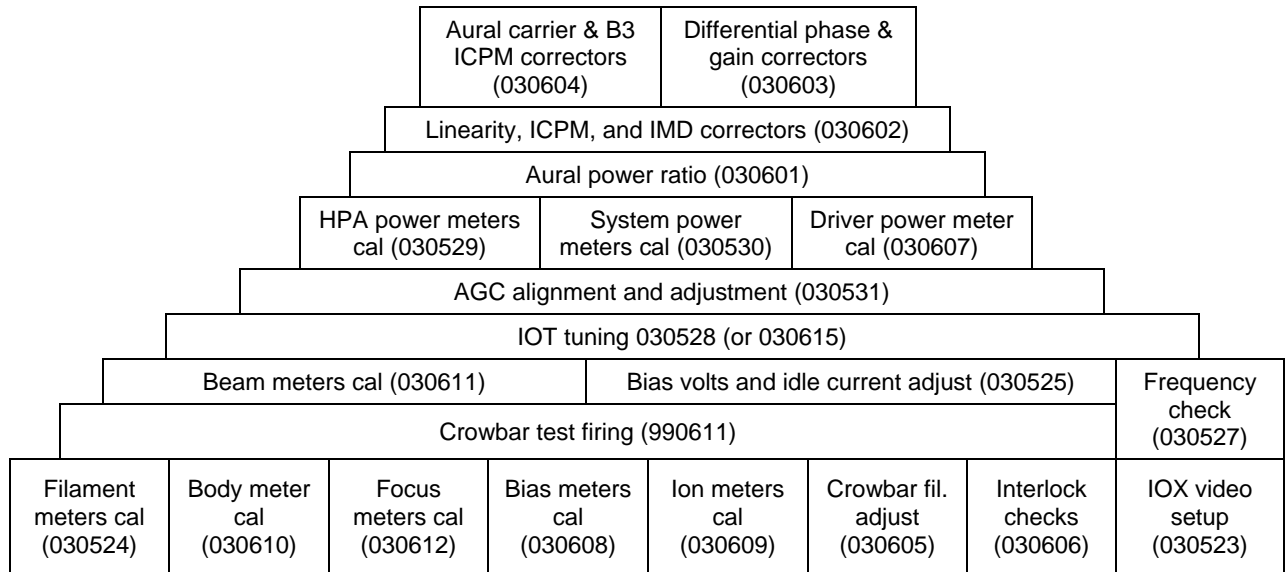


Figure 1. IOX Performance Pyramid

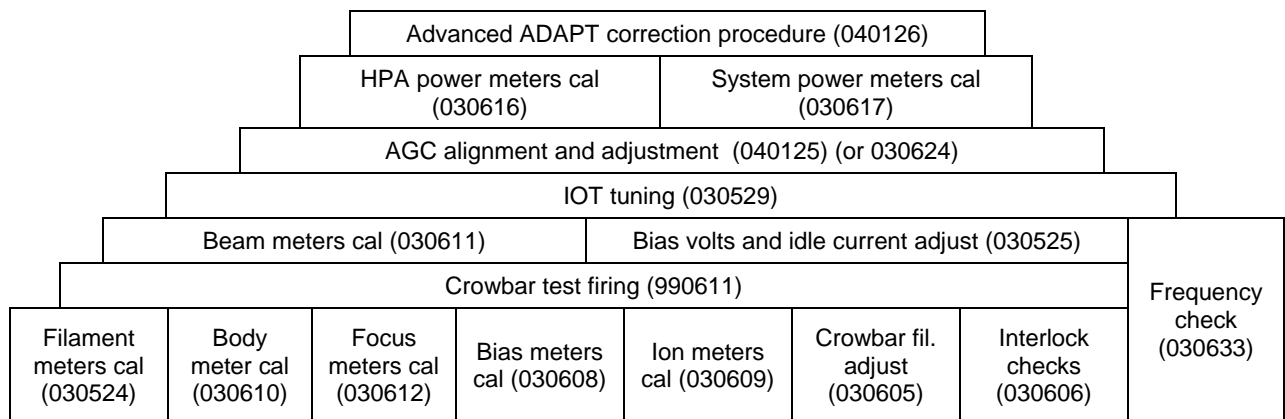


Figure 2. DCX Performance Pyramid.



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Maintenance Manual

**INSERT PROCEDURAL BULLETINS HERE and DISCARD THIS PAGE**

- 030523 Setup of IOX Video Processing
- 030524 Adjustment of IOT Filaments
- 030525 Adjustment of IOT Bias Voltage and Idle Current
- 030527 IOX Carrier Frequency Measurement and Adjustment
- 030528 IOX Tuning with Sideband Adapter
- 030529 Calibrate HPA Forward and Reverse Power Meters
- 030530 Calibrate IOX system Forward and Reverse Power Meters
- 030531 IOX AGC Setup Procedure
- 030601 Adjustment of IOX Aural Carrier Power
- 030602 Adjustment of IOX LF Linearity, ICPM, (Intermodulation) Precorrection circuits
- 030603 Adjustment of IOX Differential Gain and differential Phase Precorrection circuits
- 030604 Adjustment of IOC B3 ICPM and Aural Carrier Correction Circuits
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- 030606 IOX/DCX Interlock Check Procedure
- 030607 Calibration of IOX HPA Drive Power Meter
- 030608 Calibration of IOX/DCX Grid Voltage and Current Meters
- 030609 Calibration of IOX/DCX Ion Voltage and Current Meters
- 030610 Calibration of IOX/DCX Body Current Meter
- 030611 Calibration of IOX/DCX Beam Voltage and Current Meters
- 030612 Calibration of IOX/DCX Focus Voltage and Current Meters
- 030615 IOT Tuning with Network Analyzer or Tracking Generator
- 030616 Calibration of DCX HPA Power Meters
- 030617 Calibration of DCX System Power Meters
- 030624 DCX AGC Setup Procedure
- 030626 Recommended NTSC Test Equipment Setup
- 030629 Cooling System Flush Procedure
- 030633 ADAPT Frequency Adjustment
- 040125 ADAPT Exciter AGC Setup: DCX and Advantage
- 040126 Advanced ADAPT Correction Procedure



## IOX® / DCX® Series UHF-TV Transmitter

### Maintenance Manual

040503	Emergency PLC Bypass Procedure
040704	IOX/DCX HPA Controller Backplane Replacement
040705	Periodic Flow Meter Testing Alert
040831	Troubleshooting Crowbar Events: IOX/DCX
940911	High Voltage Safety Guidelines
990611	Periodic Crowbar Testing



IOX® / DCX® Series UHF-TV Transmitter  
Maintenance Manual

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IOX® / DCX® Series UHF-TV Transmitter  
Maintenance Manual

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INFORMATION HERE and DISCARD THIS PAGE*



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2-1/2" 3-ring Binder

453265-01

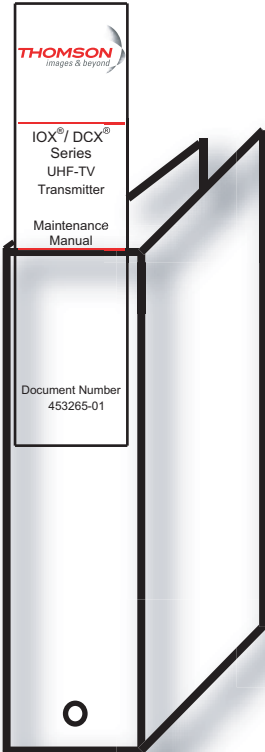
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