

# SET eXPerience Introduction of ISDB-Tb Equipment for Digital Terrestrial Television System

NEC Corporation

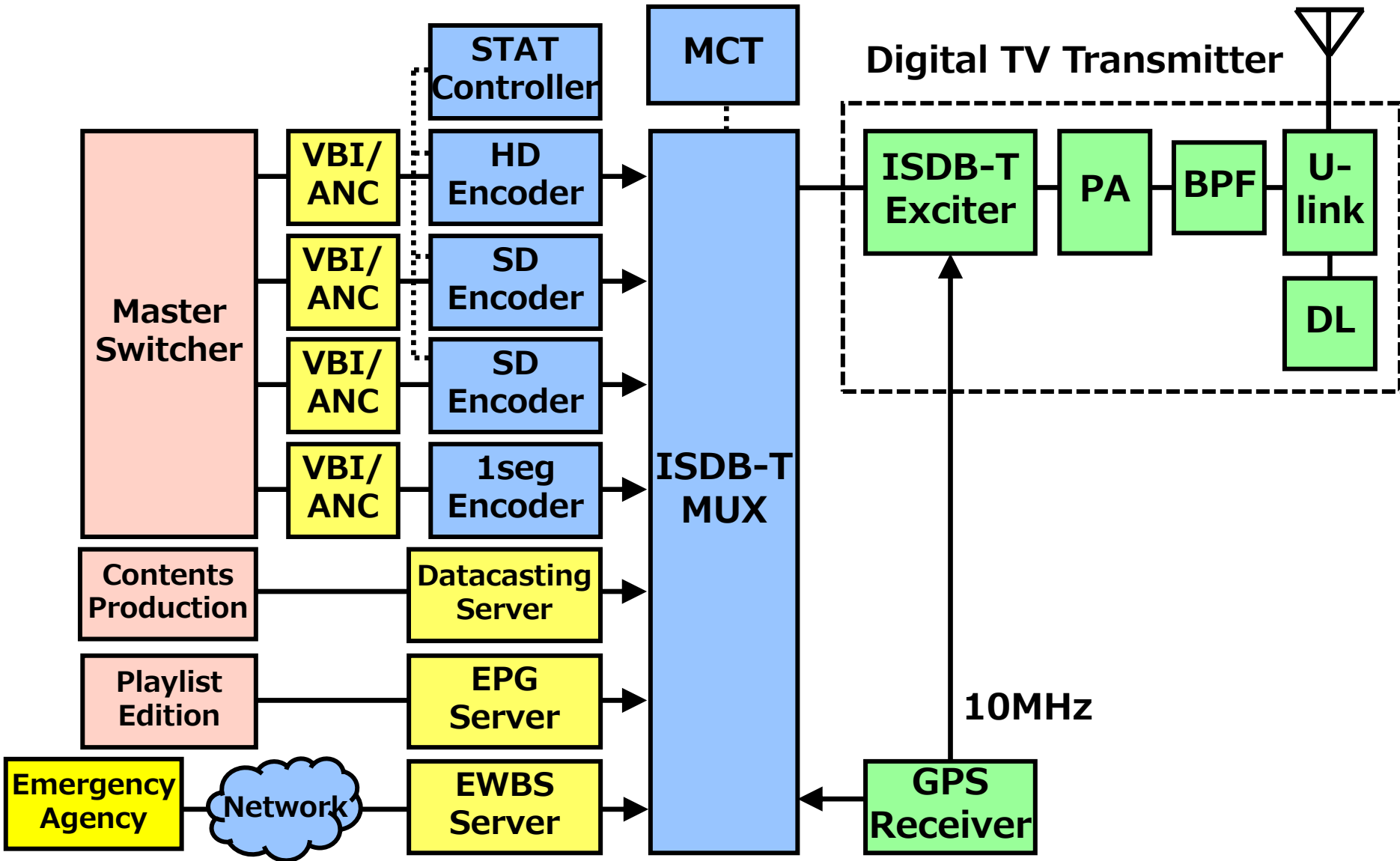


**NEC continues to provide Headend equipment and Digital TV Transmitter for Digital Terrestrial Television Service in Brazil.**

**The lineup of our equipment are as follows:**

- H.264 Encoder for Stationary service (SD and HD)**
- H.264 Encoder for Mobile service (SD and HD)**
- H.264 Decoder for Stationary and Mobile service**
- ISDM-T Multiplexer**
- ISDB-T Frame Switcher**
- TS Compressor and De-compressor**
- EWBS (Emergency Warning Broadcasting System) Server**
- EPG (Electrical Program Guide) Server**
- Statistical Controller**

# ISDB-Tb Digital Terrestrial TV System



## HD/SD Encoder for Stationary service



XF-730 Mounting Shelf

MUX	SYNC	MUX-IF	HD ENC	SD ENC	SD ENC	SD ENC	XCONT
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- **Video Input** : HD-SDI(1080i/720p) or SD-SDI(576i/480i)
- **Audio Input** : Embedded Audio, 16ch
- **Video Encoding** : H.264 High Profile @ Level 4.0
- **Audio Encoding** : MPEG-4 HE AAC profile v2 L4
- **Audio Stream** : LATM/LOAS and ADTS
- **Subtitle** : Digital subtitle in ancillary
- **Delay** : Low delay process of 0.5sec
- **Mounting Shelf** : Up to 5 boards in XF-730 Shelf

## 1seg. Encoder for Mobile service



XF-730 Mounting Shelf

MUX	SYNC	MUX-IF	1seg ENC	HD ENC	SD ENC	DEC	XCONT
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- **Video Input** : HD-SDI(1080i/720p) or SD-SDI(576i/480i)
- **Audio Input** : Embedded Audio, 2ch
- **Video Encoding** : H.264 Baseline Profile @ Level 1.3
- **Audio Encoding** : MPEG-4 HE AAC profile v2 L2
- **Audio Stream** : LATM/LOAS and ADTS
- **Subtitle** : Digital subtitle in ancillary
- **Delay** : Low delay process
- **Mounting Shelf** : Up to 5 boards in XF-730 Shelf

## HD/SD/1seg. Decoder



### XF-730 Mounting Shelf

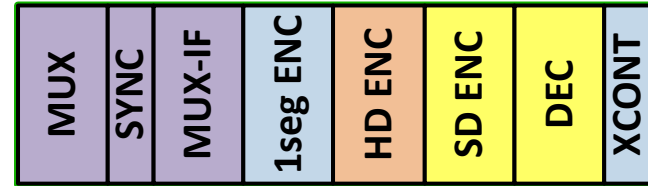
MUX	SYNC	MUX-IF	1seg ENC	HD ENC	SD ENC	DEC	XCONT
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- Video Output : HD-SDI(1080i/720p) or SD-SDI(576i/480i)
- Audio Output : Embedded Audio, 16ch
- Video Decoding : H.264 Baseline /Main /High Profile
- Audio Decoding : MPEG-4 HE AAC profile
- Audio Stream : LATM/LOAS and ADTS
- Mounting Shelf : Up to 5 boards in XF-730 Shelf

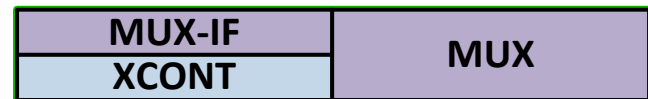
## ISDB-T Multiplexer



### XF-730 Mounting Shelf(3RU)



### XF-712 Mounting Shelf(1RU)



- **TS Input** : 6 inputs and 12 extension inputs
- **Sync Input** : 10MHz, 1PPS and STC/GPO
- **Function** : Input bitrate limiter
  - : Input PID filtering and replacement
  - : PSI generation and multiplexing
  - : TOT generation and multiplexing
  - : PCR generation and multiplexing
  - : TS compression (Conversion to DVB-TS)

# MCT (Multiplexer Control Terminal)

## Multiplexer Control Terminal

### Factory Computer



### Configuration Screen

MCT Multiplexer Control Terminal SBTVD SYS-1 line

OP Pattern: 104 HD/SD Encoder-1, 2, & 3 (1ES) & 1-seg Encoder On-air

Stream	Status	Limit	bps	Speed	QoS	Other
TS IN-1	Datacasting					
TS IN-2	Datacasting (EM)					
TS IN-3	CDR Server					
TS IN-4						
TS IN-5						
TS IN-6						
H.264 #1	Alarm Warn	Limit	15,000,000 bps	Speed	QoS	Other
H.264 #2	Alarm Warn	Limit	75,000,000 bps	Speed	QoS	Other
1seg #1	Alarm Warn	Limit	75,000,000 bps	Speed	QoS	Other
1seg #2	Alarm Warn	Limit	350,000 bps	Speed	QoS	Other

Output Bit Rate: 15.395235 Mbps

- Configuration of SI/PS
- Configuration of TMCC
- Operation Pattern Control
  - HD + SD + 1seg
  - SD + SD + SD + 1seg
- SFN Management
- Summer Time Control
- EWBS control
- Audio Mode Control to Encoder



## ISDB-T Frame Switcher, TS-S1631



- **Input Number** : 3 BTS inputs (Triple configuration)
- **Distribution** : 4 outputs
- **Reference Input** : 10MHz and T-Sync (STC/GOP)
- **Function** : Seamless changeover  
: Automatic and Manual changeover

## Sync Generator, TS-G1631



- **Output Signal** : STC, GOP and ISDB-T Sync
- **Distribution** : 2 outputs
- **Reference Input** : 10MHz and Black burst
- **Configuration** : Main and backup

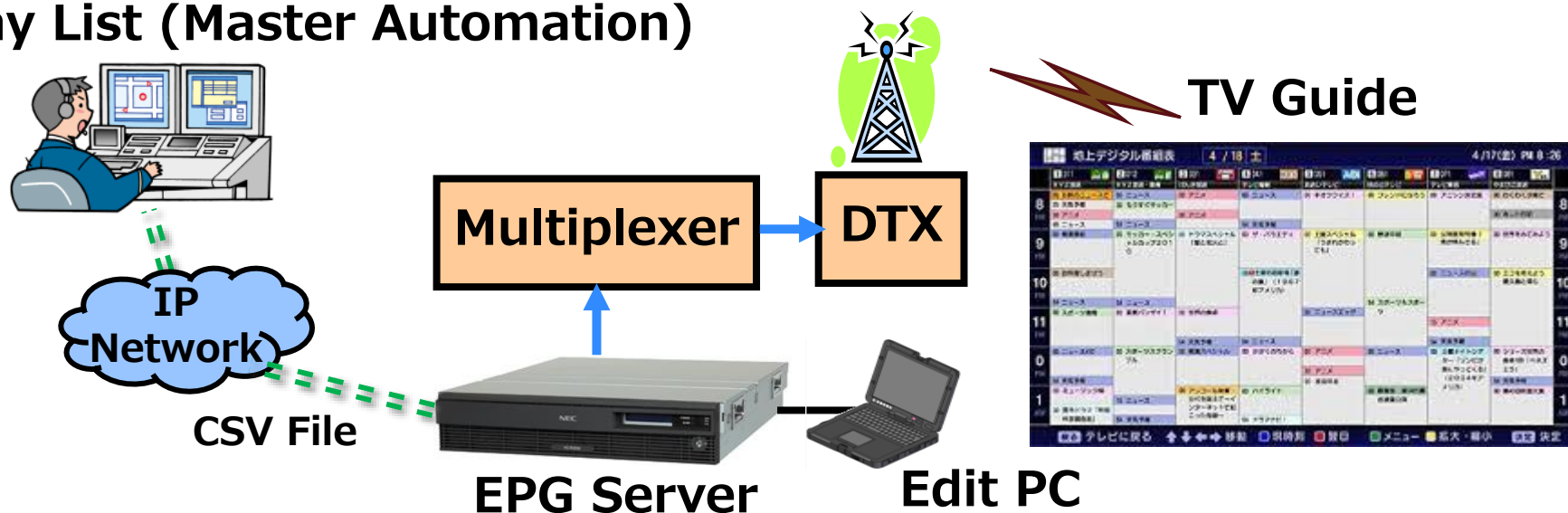
## TS Compressor and De-compressor

- High quality compression of BTS into DVB-S/S2
- From 204byte to 188 byte length compression
- Whole important information can be transmitted
- SFN operation available
- Unique compression with NEC technology



## Electrical Program Guide Server

### Play List (Master Automation)

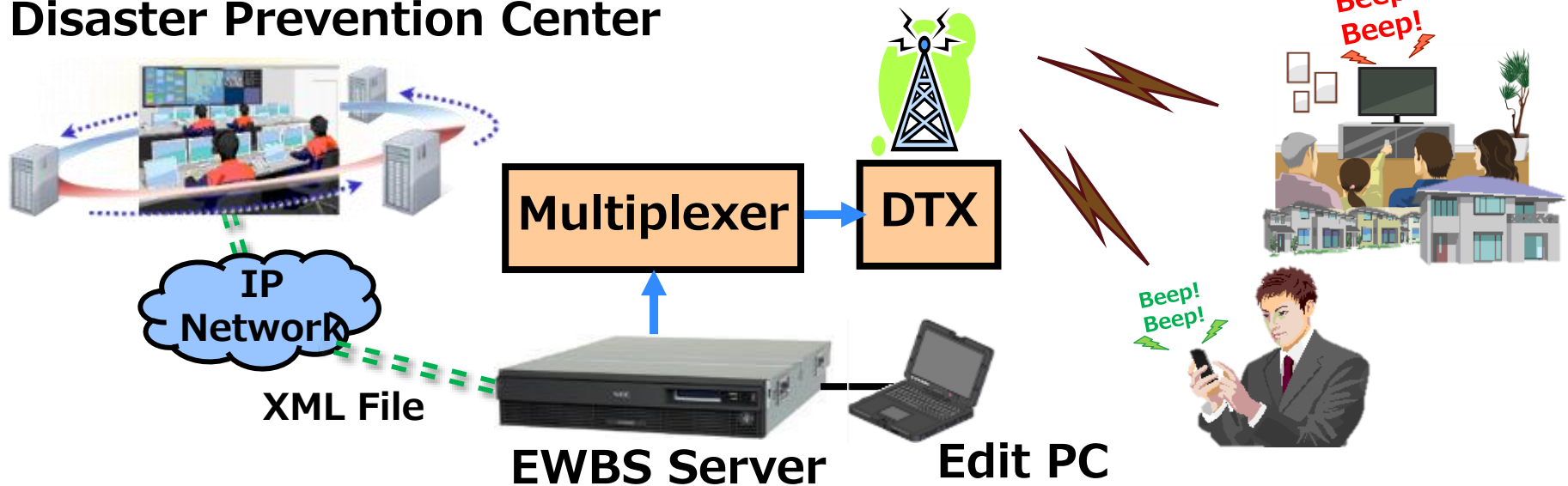


- Program Information (Title, Time, Description, etc)
- H-EIT (Up to 8) and L-EIT Generation
- Parental Rate Control
- Copyright Control
- Audio Mode and Language Information

# EWBS Server (Emergency Warning Broadcasting System)

## EWBS Server

Disaster Prevention Center



- Emergency Message for Stationary and Mobile
- Beep Sound for safety evacuation
- Automatic start up for TV set
- Limited EWBS service by Area Code
- Combination between EWBS and Datacasting

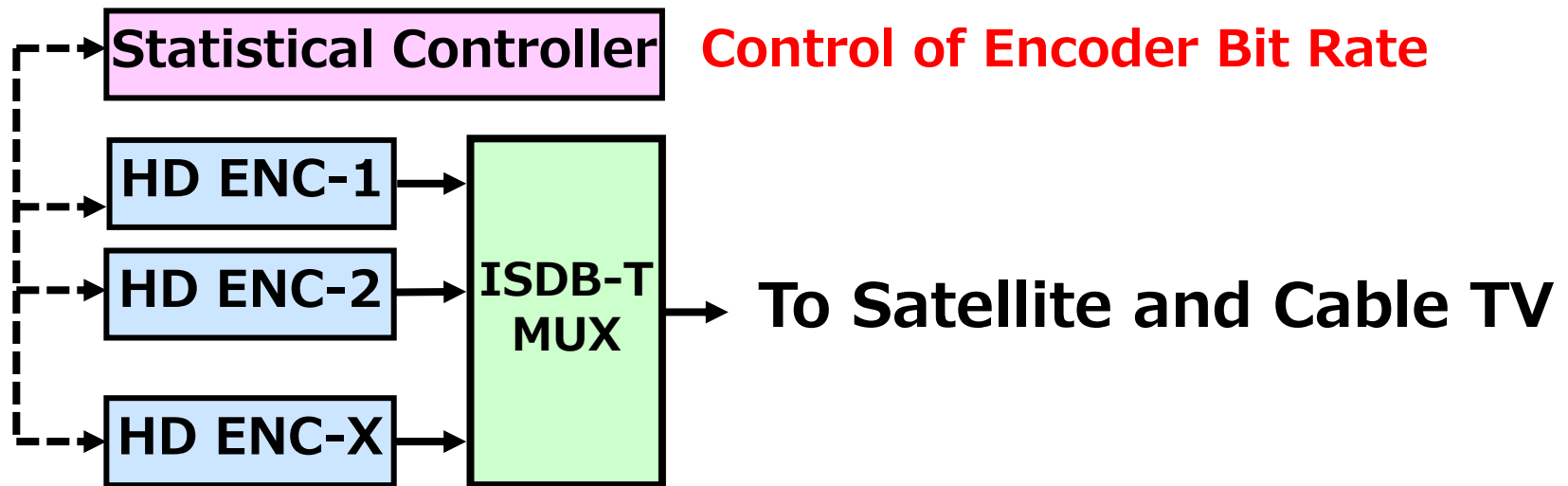
## STAT Controller



## MF-730 Mounting Shelf



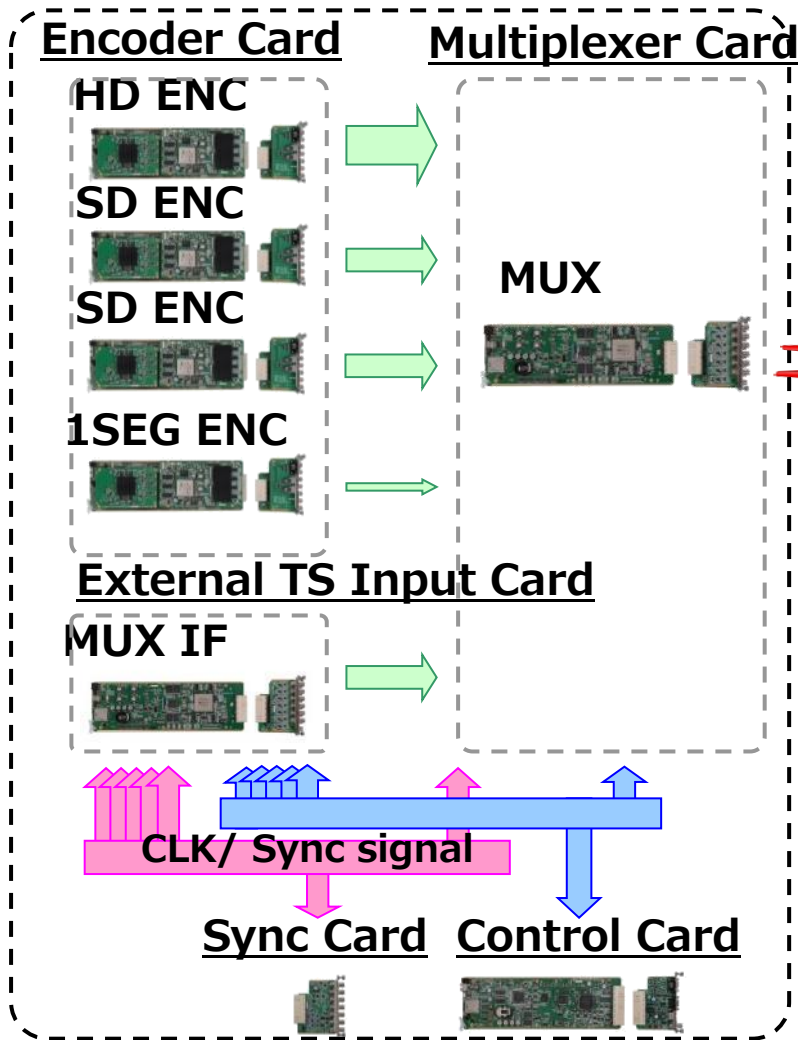
- **STAT Control up to 32 Encoder (16 groups)**
- **Compact Size (Card type Controller)**
- **Faster Video Tracking than existing controller**



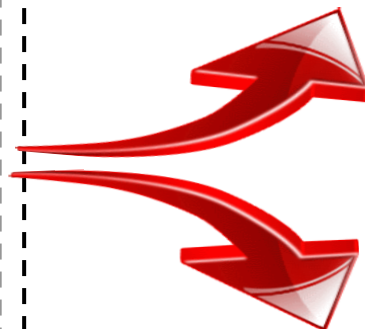


# Multi-function Frame for Encoder and Multiplexer

## Multi-function Frame



## 1U Mounting Shelf, XF-712



## 3RU Mounting Shelf XF-730

## Higher performance for your smarter operation

### Ecology & Economy

- Higher efficiency (UHF>38%, VHF>46%)
- Smaller footprint

### Easy maintenance

- User Friendly interface
- Light weight PA (maintenance by 1 person)
- High commonality of spares

### Flexible system configuration

- N+1 system, Multiple transmitter in one rack.



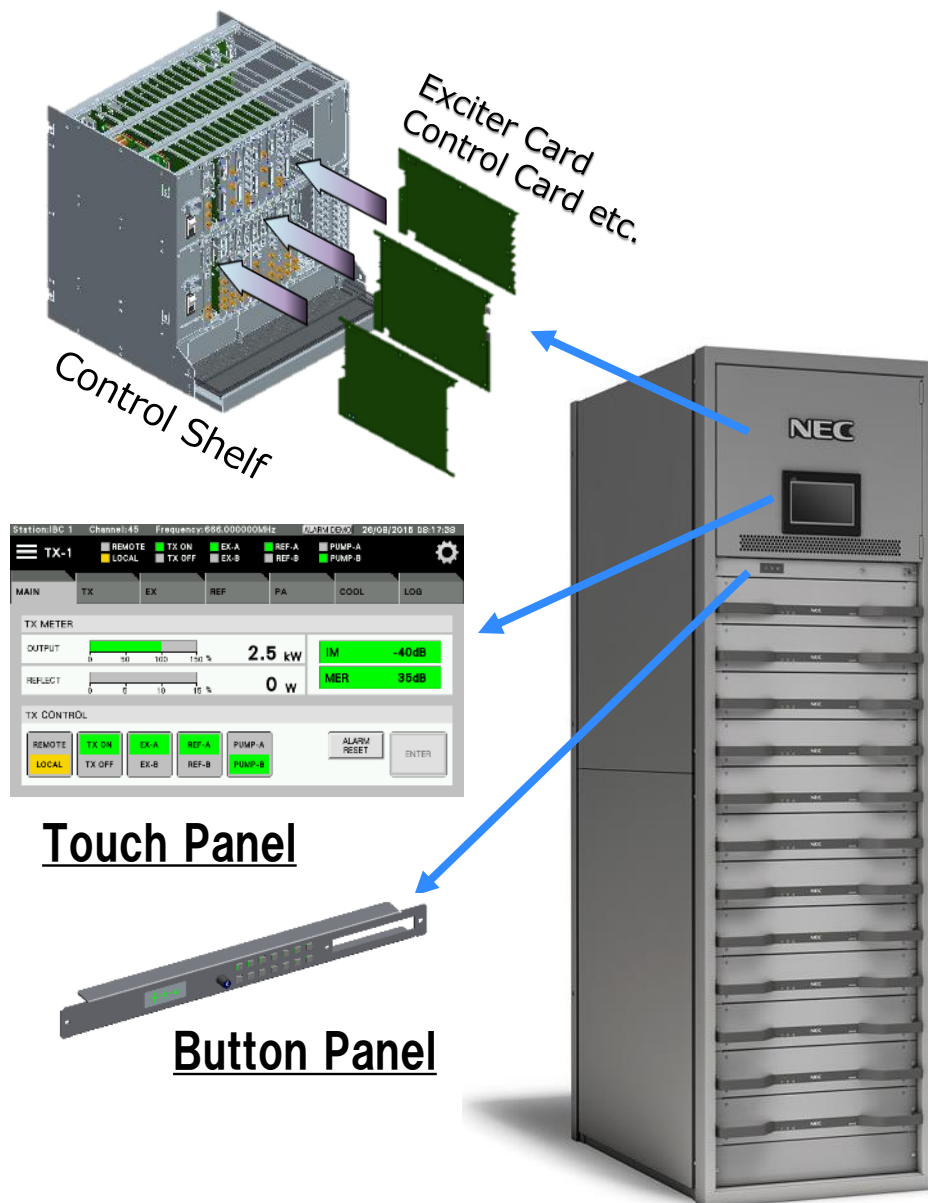
DTU-H10/DTV-H20  
UHF/VHF Liquid cooled  
Transmitter

## Exciter

- Card type Exciter
- Apply to Multi-DTX and N+1
- ASI and IP Inputs
- All-band direct conversion
- Built-in GPS Receiver

## Controller

- Touch panel operation
- Button panel for backup

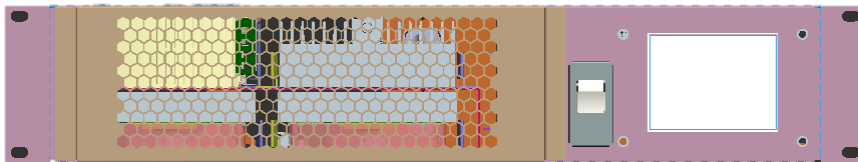




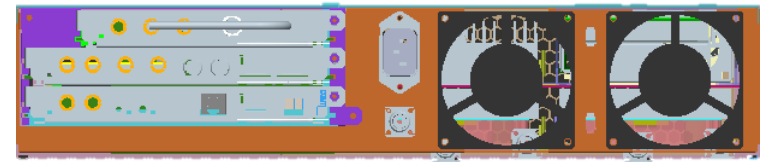
# Air-Cooled TV Transmitter, DTU-L10 (Low Power)

- 10W to 600W Output
- Wideband Design for common use among DTXs
- The following two types of Power Amplifiers are available:

OUTPUT	10W to 200W	Up to 400W	—
W [mm]	W480		
D [mm]	D450		
H [mm]	2U	3U	—
Weight	Less than 14kg	Less than 20kg	—



Front view



Rear view

**2RU PA (Up to 200W)**

**3RU PA (Up to 400W)**

# Air-Cooled TV Transmitter, DTU-M10 (Middle Power)



## 650W Air cooled PA

- 600W to 3kW Output
- High efficiency more than 38% in UHF band
- Easy Switch-over from Analog to Digital
- Light weight PA (maintenance possible by 1 person)
- Wideband Design for common use among DTXs
- Band pass filter (optional) built into the rack



# Liquid-Cooled TV Transmitter, DTU-H10 (High Power)

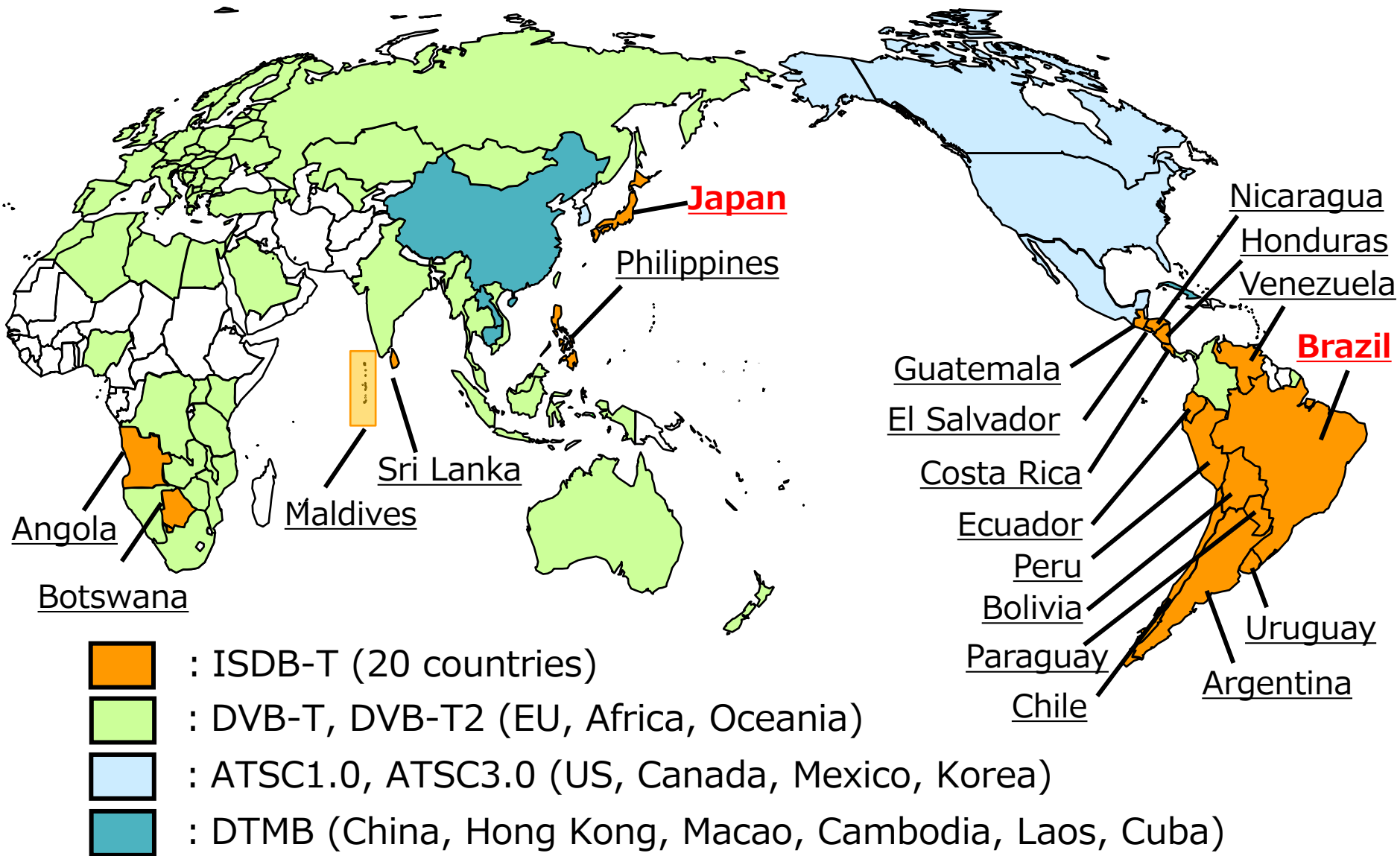


## 1300W Liquid cooled PA

- 3kW to 15kW Output or more
- Higher efficiency more than 38% in UHF
- Easy Switch-over from Analog to Digital
- Light weight PA (maintenance possible by 1 person)
- Wideband Design for common use among DTX
- Pump and Band pass filter (optional) built into the rack



# Promotional Activities for ISDB-T



# SD/HD/4K Digital Terrestrial Transmission System

	<b>DVB-T</b>	<b>DVB-T2</b>	<b>ISDB-T</b>	<b>ATSC1.0</b>	<b>ATSC3.0</b>
<b>Use area (Main market)</b>	Europe Australia	Europe (Advanced DVB-T)	Japan, South America	U.S.A, Korea Canada	U.S.A, Korea Canada
<b>HD/SDTV Fixed reception</b>	SD and HD Multi Channel	SD,HD&4K Multi Channel	SD and HD Multi Channel	HD TV	4K Multi Channel
<b>Portable reception</b>	DVB-H	T2 LITE	One-seg	Media FLO	Available
<b>Coding Technology</b>	MPEG-2	MPEG-4	MPEG-2 MPEG-4	MPEG-2	HEVC
<b>Transport Stream</b>	MPEG-2 system	MPEG-2 system	MPEG-2 system	MPEG-2 system	MPEG-MMT
<b>Modulation</b>	64QAM	64QAM 256QAM	64QAM QPSK	8VSB	COFDM

 **Orchestrating** a brighter world

**NEC**