



BLONDER TONGUE
L A B O R A T O R I E S

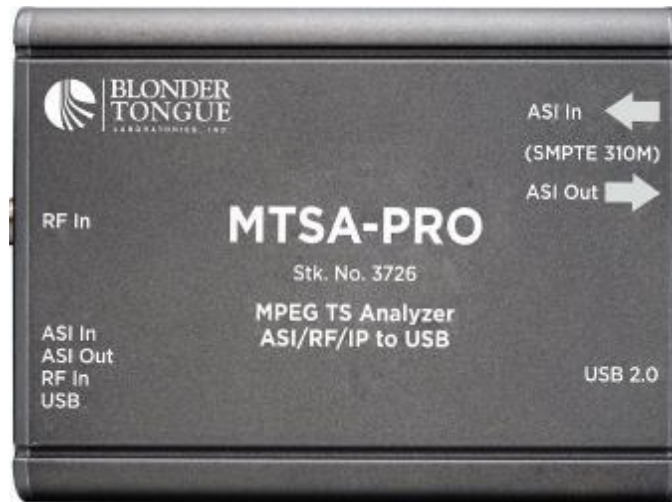
Making Measurements in a CATV System

Utilizing Test Equipment for Accurate Results

BT Test Equipment



BT-QAM-PRO

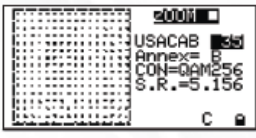
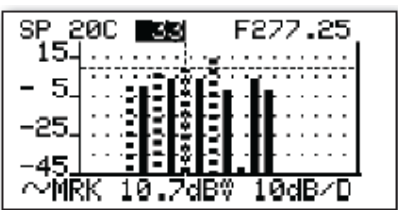
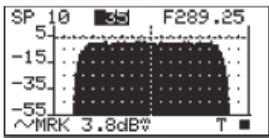
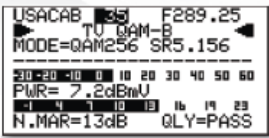
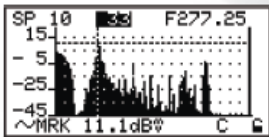


MTSA-PRO



BTPRO-8000S

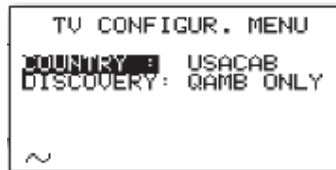
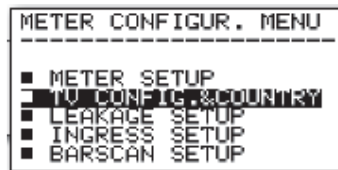
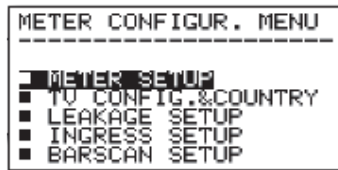
BT-QAM-PRO - Stock #4229



CHAN	IPWR	aBER	EMER	TYPE
96	0	9		AnTV
19	6	<E-9>	40	QAM
10	3	11		AnTV
25	10	<E-9>	40	QAM
33	3	14		AnTV
39	0	<E-9>	40	QAM

- Measures CATV QAM, Broadcast 8-VSB, and NTSC Analog channels
- MER, aBER, bBER, Noise Margin & Level Management
- Spectrum Display
- Constellation Display
- Barscan Display
- Data Logger
- Custom Memory plans
- Leakage/Ingress Measurement
- SMART Program USB interface
 - Upload/download channel plans
 - Download and store/print Data Logger info
 - Meter Firmware Upgrade

BT-QAM-PRO, Stock #4229



■ Meter

■ Config Menu

■ Meter Setup

- Make sure dBmV set for UNITS - US Standard

■ TV Config & Country

- Can select USABRO, USAHRC, USAIRC, **USACAB**
- **QAM B ONLY**, QAM A ONLY, VSB ONLY, ALL MOD

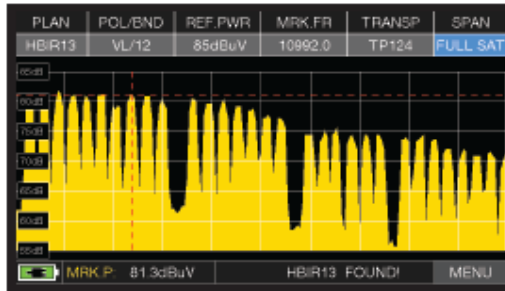
BTPRO-8000S, Stock #4232S



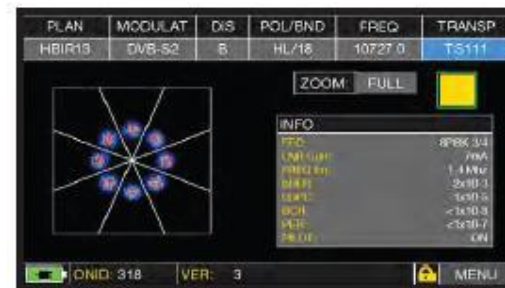
- Measures 4 - 2610 MHz
- CATV, MATV, Satellite measurements

BTPRO-8000S, Stock #4232S

- Satellite Management
 - Spectrum Analyzer
 - Constellation
 - SAT Finder
 - AZ/EL
 - MPEG Service List



QPSK constellation.



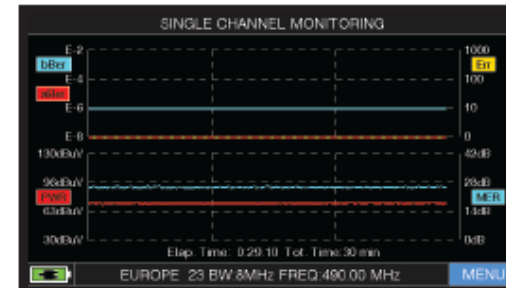
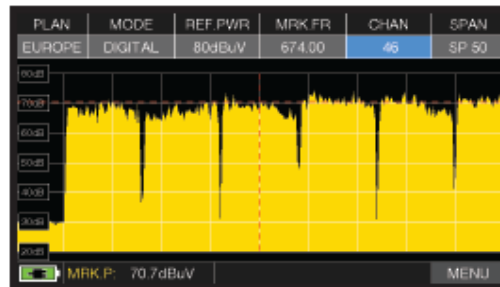
8PSK constellation.



BTPRO-8000S, Stock #4232S



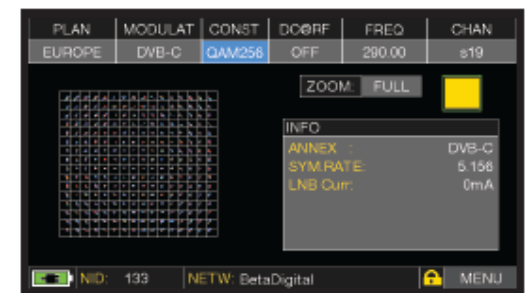
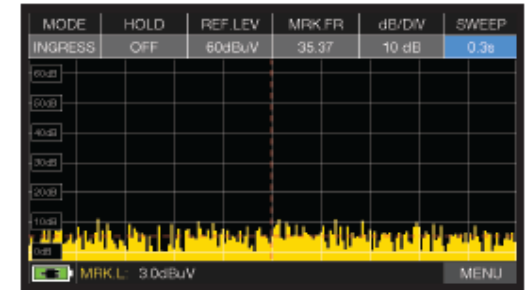
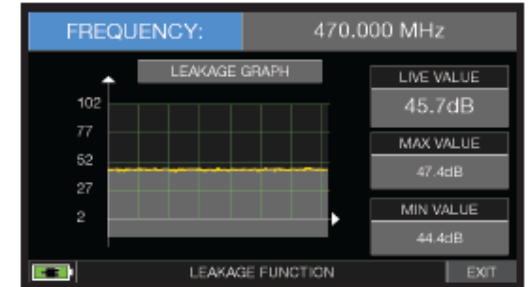
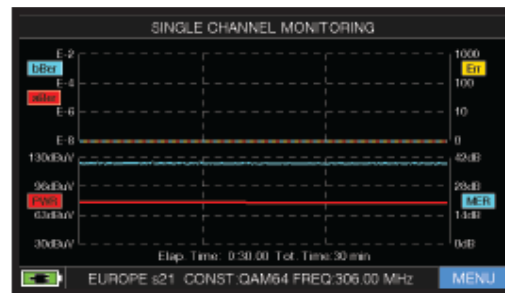
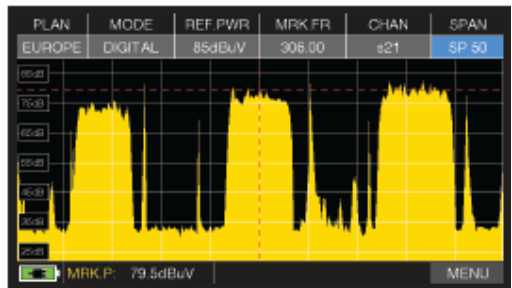
- TV (off-air) Measurements
 - Measure & Picture
 - Spectrum Analyzer
 - Constellation
 - MER vs Carrier
 - MPEG Service List
 - Channel Monitor



BTPRO-8000S, Stock #4232S



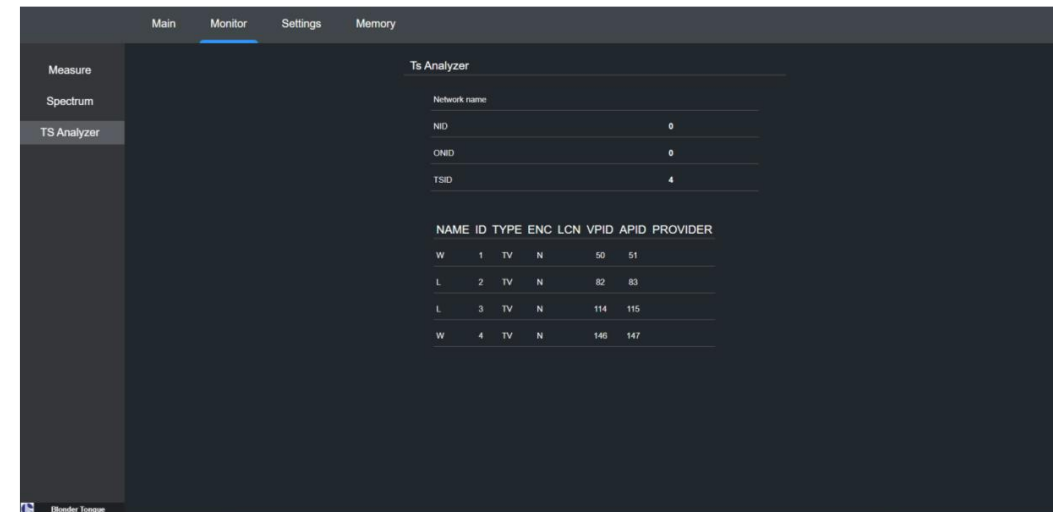
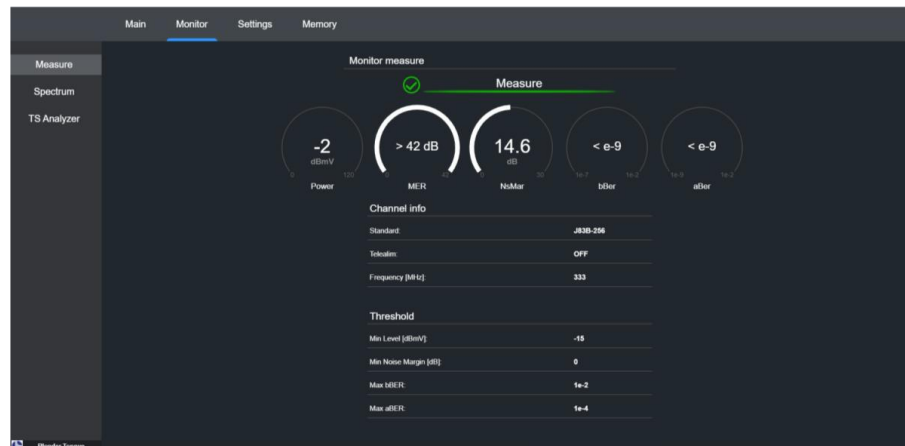
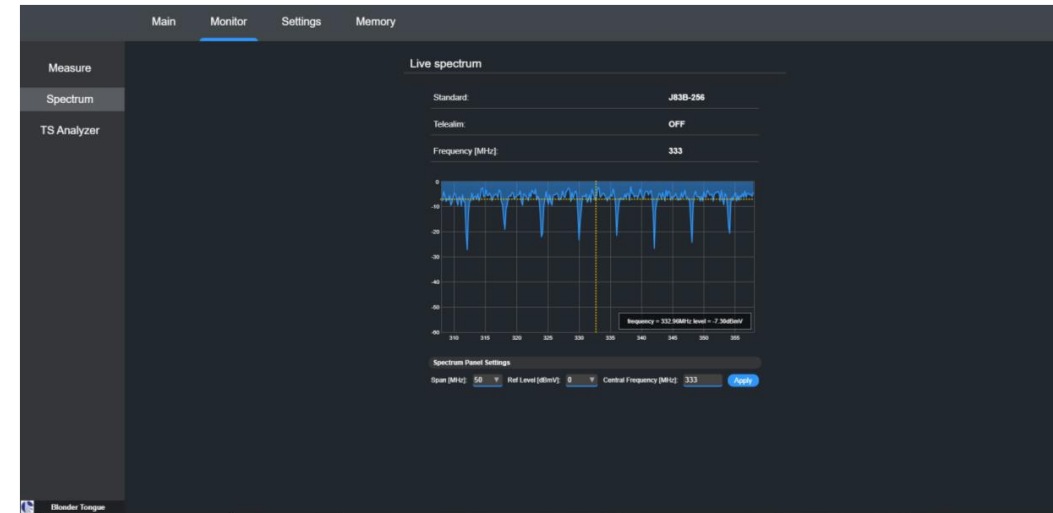
- CATV Measurements
 - Measure & Picture
 - Spectrum Analyzer
 - Constellation
 - Leakage
 - Ingress
 - MPEG Service List
 - Channel Monitor



BTPRO-8000S, Stock #4232S



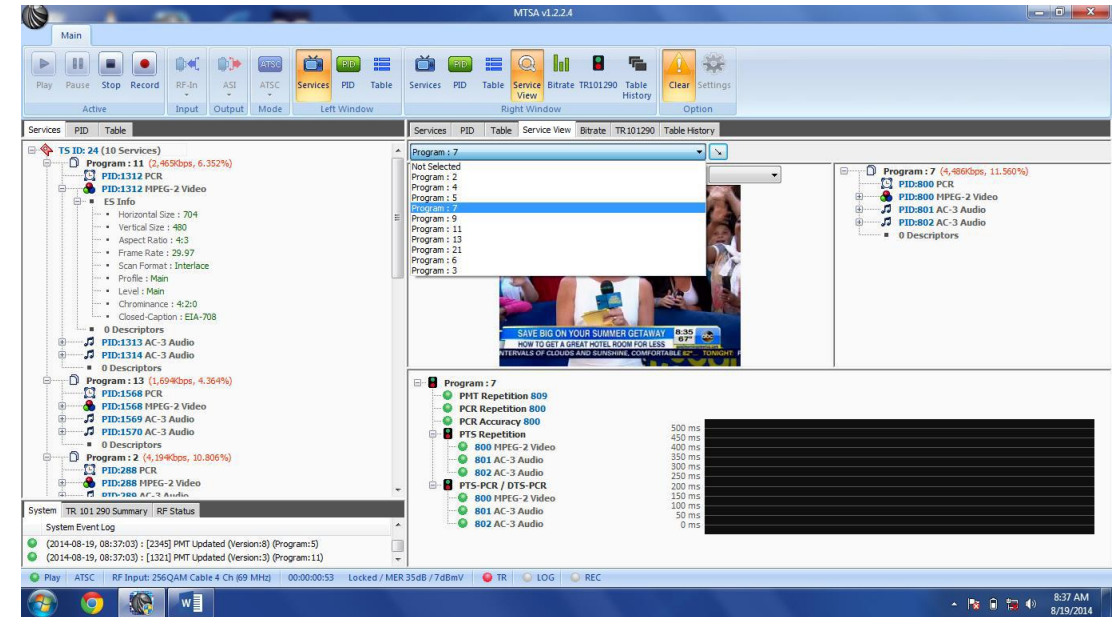
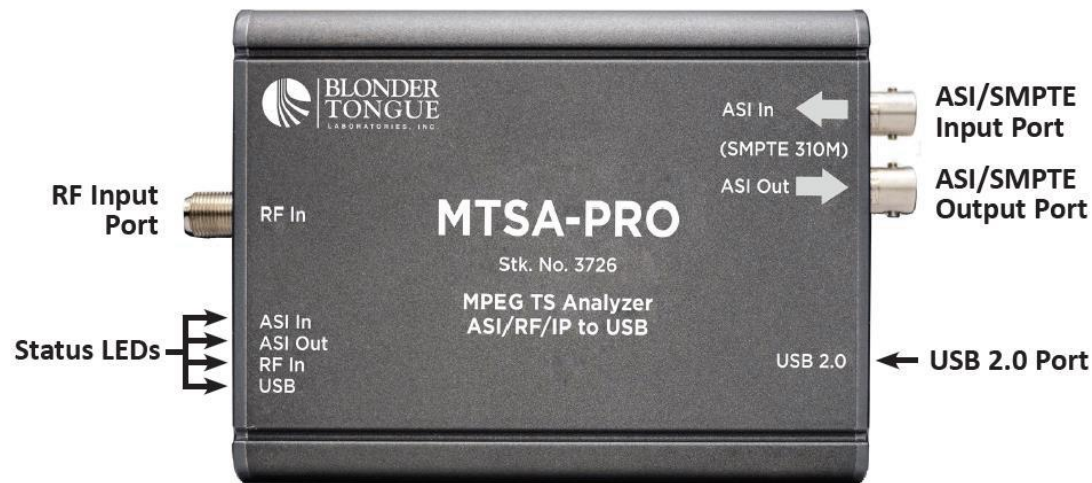
- Remote Monitoring via WEB App
- Login to unit with standard Browser
- Set channel/range to monitor
- View single channel Measurement
- View Spectrum Analysis
- View TS Analyzer for digital channels



MTSA-PRO, Stock #3726



- MPEG Transport Stream Analyzer
- RF, ASI, IP (uses computer IP port) input
- ASI Output (pass-through)
- Works on USB 2.0 to laptop w/MTSA software



MTSA-PRO, Stock #3726



■ Setup

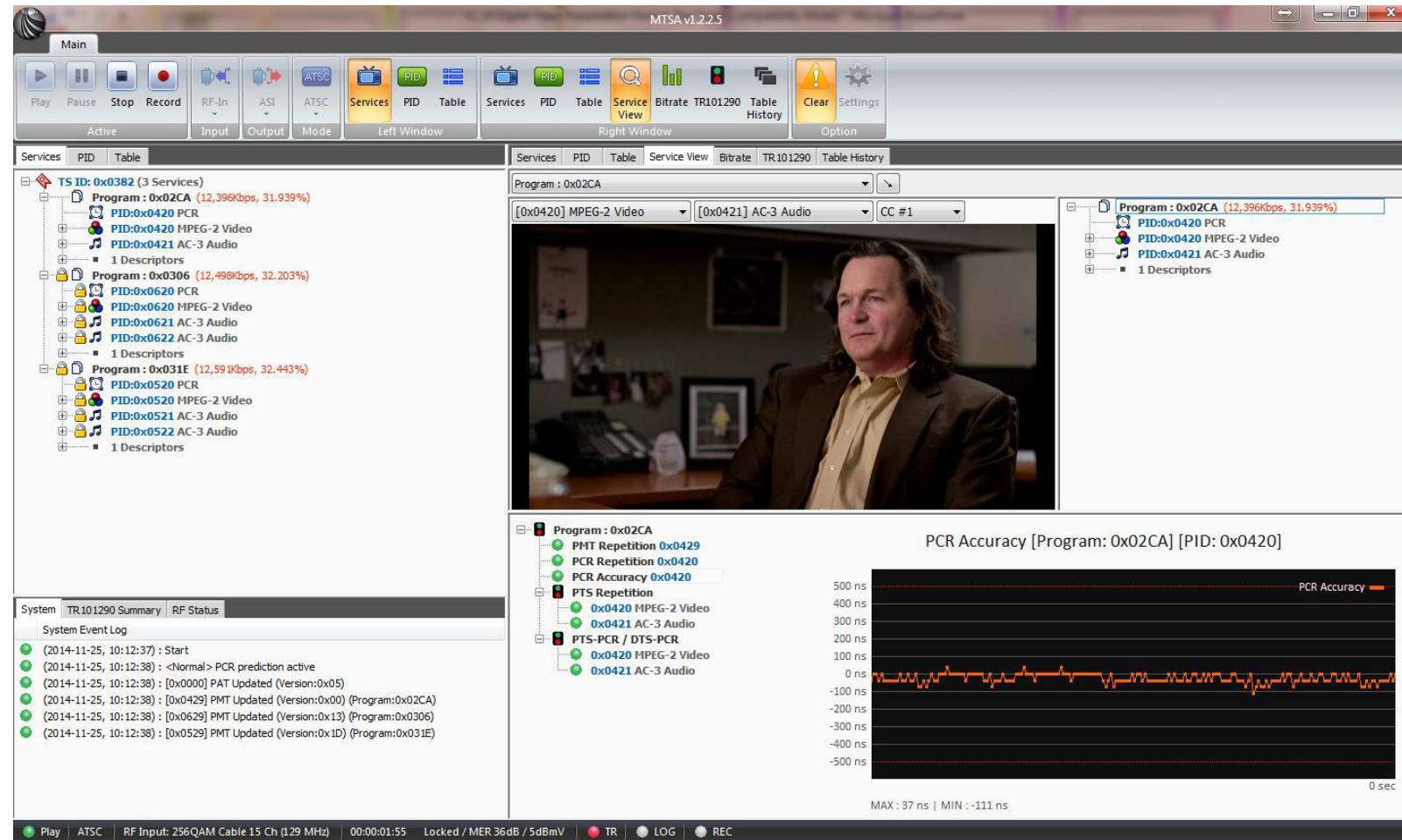
The screenshot displays the MTSA v1.2.2.5 software interface. The main window is titled "Main" and contains a toolbar with various icons for playback, input, and settings. Below the toolbar, there are several panels and windows:

- Left Window:** Shows "Services" and "PID" information for "TS ID: 0x0000 (0 Services)".
- Right Window:** Shows "PID Information (0)".
- RF Input Dialogs:** Three "RF Input" dialog boxes are open, each showing configuration options for modulation (256QAM), spectrum inversion (Spectrum Inverted/*), and frequency (129 KHz, 40 MHz ~ 1002 MHz). The dialog boxes also show "Locked / MER" values (31dB / 5dBmV, 35dB / 5dBmV, and 36dB / 5dBmV).
- System Panel:** Located at the bottom, it shows "System" information, "TR101290 Summary", "RF Status", and "System Event Log".

The status bar at the bottom of the interface displays: Stop ATSC TS Input: ASI 00:00:00 0 Kbps TR LOG REC.

MTSA-PRO, Stock 3726

- Playing the Stream
- Can also Record to Send to BT Engineering



The screenshot displays the MTSA-PRO v1.2.2.5 software interface. The main window is divided into several sections:

- Top Panel:** Contains playback controls (Play, Pause, Stop, Record), input/output options (RF-In, ASI, ATSC), and window management (Services, PID, Table, Service View, Bitrate, TR101290, Table History, Clear, Settings).
- Left Panel:** Shows a tree view of services under "TS ID: 0x0382 (3 Services)". It lists three programs: 0x02CA (12,396Kbps, 31.939%), 0x0306 (12,498Kbps, 32.203%), and 0x031E (12,591Kbps, 32.443%). Each program lists its associated PIDs for PCR, MPEG-2 Video, and AC-3 Audio, along with descriptor counts.
- Center Panel:** Displays a video stream from "Program : 0x02CA" with selected "[0x0420] MPEG-2 Video" and "[0x0421] AC-3 Audio". The video shows a man in a suit.
- Right Panel:** Shows a detailed view of "Program : 0x02CA (12,396Kbps, 31.939%)", listing its PIDs for PCR, MPEG-2 Video, and AC-3 Audio.
- Bottom Panel:** Features a "System" tab with a "System Event Log" showing timestamps and events like "Start", "PCR prediction active", and "PAT Updated". It also includes a "PCR Accuracy [Program: 0x02CA] [PID: 0x0420]" graph showing a signal fluctuating around 0 ns, with a legend for "PCR Accuracy".
- Status Bar:** At the bottom, it shows "Play ATSC", "RF Input: 256QAM Cable 15 Ch (129 MHz)", "00:00:01:55", "Locked / MER 36dB / 5dBmV", "TR", "LOG", and "REC".

MTSA-PRO, Stock 3726



- Can break down TS to binary bits
- See all Descriptors
- See all Tables

The screenshot displays the MTSA v1.2.2.4 software interface. The main window is titled 'Main' and contains several toolbars and panes. The 'Services' pane on the left shows a tree view of the transport stream (TS ID: 2157) with two services: '2-1 WCBS-HD Program : 1' and 'PID:52 AC-3 Audio'. The 'Table' pane in the center lists various tables including PAT, PMT, MGT, TVCT, EIT, ETT, and STT. The 'Parameter' pane on the right shows a detailed view of the PMT - Transport Stream Program Map Section, listing parameters such as Section Header, PCR PID, Program Info Descriptor Length, Registration Descriptor, Smoothing Buffer Descriptor, Component Name Descriptor, Redistribution Control Descriptor, ES Info, Stream Type, Elementary PID, ES Info Descriptor Length, and Video Stream Descriptor. The 'System' pane at the bottom shows the system event log and status information.

Table	Full Name
PAT	Program Association Table
PMT	Program Map Table
MGT	Master Guide Table
TVCT	Terrestrial Virtual Channel Table
EIT	Event Information Table
ETT	Extended Text Table
STT	System Time Table

Parameter	Hex	Value	Bits	Descriptic
PMT - Transport Stream Program Map Section				
Section Header	0x02	2	64	PMT Infc
Reserved	0x07	7	3	
PCR PID	0x0031	49	13	
Reserved	0x0F	15	4	
Program Info Descriptor Length	0x001D	29	12	
Registration Descriptor	0x05	5	48	
Smoothing Buffer Descriptor	0x10	16	64	
Component Name Descriptor	0xA3	163	96	
Redistribution Control Descriptor	0xAA	170	24	
ES Info	0x02	2	224	MPEG-2'
Stream Type	0x02	2	8	MPEG-2'
Reserved	0x07	7	3	
Elementary PID	0x0031	49	13	
Reserved	0x0F	15	4	
ES Info Descriptor Length	0x0017	23	12	
Video Stream Descriptor	0x02	2	40	

MTSA-PRO, Stock #3726



- Shows all TR 101 290
- Industry STD errors

No.	Indicator	Comment
1.1	TS_sync_loss	Essential for access to TS data
1.2	Sync_byte_error	May not necessarily prevent decoding of content
1.3	PAT_error	Essential for access to TS data
1.3.a	PAT_error_2	Essential for access to TS data
1.4	Continuity_count_error	May not necessarily prevent decoding of content
1.5	PMT_error	Essential for access to TS data
1.5.a	PMT_error_2	Essential for access to TS data
1.6	PID_error	May not necessarily prevent decoding of content

No.	Indicator	Comment
2.1	Transport_error	
2.2	CRC_error	Applies to PAT and PMT only
2.3	PCR_error	
2.3a	PCR_repetition_error	
2.3b	PCR_discontinuity_indicator_error	
2.4	PCR_accuracy_error	
2.5	PTS_error	
2.6	CAT_error	

No.	Indicator	Comment
3.3	Buffer_error	
3.4	Unreferenced_PID	
3.4.a	Unreferenced_PID	
3.9	Empty_buffer_error	
3.10	Data_delay_error	

The screenshot shows the MTSA v1.2.2.5 software interface. The main window displays a tree view of services and programs. The right pane shows a list of parameters and their error counts. The bottom pane shows a system event log.

Parameter	# Error	Last Error Time/Pos	Event Detail
TR101290 Priority 1			
1.1 TS Sync Loss	0		
1.2 Sync Byte Error	0		
1.3 PAT Error	0		
1.4 Continuity Count Error	0		
1.5 PMT Error	0		
1.6 PID Error	0		
TR101290 Priority 2			
2.1 Transport Error	0		
2.2 CRC Error	0		
2.3 PCR Repetition Error	0		
2.4 PCR Accuracy Error	0		
2.5 PTS Error	0		
2.6 CAT Error	0		
TR101290 Priority 3			
3.1 NIT Error	0		
3.2 SI Repetition Error	0		
3.3 Buffer Error	0		
3.4 Unreferenced PID Error	292	2014-11-25, 10:17:29	Unreferenced PID Error [PID:0x1FF8]
3.5 SDT Error	0		
3.6 EIT Error	0		
3.7 RST Error	0		

System Event Log:

- (2014-11-25, 10:12:37) : Start
- (2014-11-25, 10:12:38) : <Normal> PCR prediction active
- (2014-11-25, 10:12:38) : [0x0000] PAT Updated (Version:0x05)
- (2014-11-25, 10:12:38) : [0x0429] PMT Updated (Version:0x00) (Program:0x02CA)
- (2014-11-25, 10:12:38) : [0x0629] PMT Updated (Version:0x13) (Program:0x0306)
- (2014-11-25, 10:12:38) : [0x0529] PMT Updated (Version:0x1D) (Program:0x031E)