

Video Interoperability Results

Vendor	Encoder Vendor has submitted a transport stream that meets the requirements.
x	Encoder Vendor did not submit a Transport Stream that will meet the requirement for the test.
Vendor	Decoder Vendor
	No measurement.
NS	Decoder does not support the TS being tested.
TS#	Transport Stream as defined in the accompanying documents.
#	Indicates a note related to the decoders interoperability issue is available at the bottom of table.
OK	Indicates there was no interoperability issues noted.

How to Interpret Results

Explanation of Results: TS1 refers to the Transport Stream 1. The parameters of TS1 may be found in the accompanying documents. TS1 was generated by the HD MPEG-4 encoders listed in the top row.

The test results show the interoperability result when the specified TS was received by the HD MPEG-4 decoders in the first column.

The grey shaded boxes indicate that the encoder did not support the parameters of the TS to be tested and that no TS was supplied.

(There are also gray boxes associated with the ATEME decoder because it was not present during the test event.)

The "NS" notation in a box means "not supported" so that the decoder did not support the parameters of the TS to be tested.

The number in a box refers to a note at the bottom of the test results to explain the results where necessary.

The notation "OK" means that the TS generated by the encoder specified in the top row was fully interoperable with the decoder specified in the first column."



Note in Regards to Thomson 1080i 50Hz/60Hz Transport Stream Results.

Thomson submitted files for 1080i 60/50Hz content encoded in "Auto - Field Mode". This caused decoder issues after the first ASI loop, in the playback method utilized in testing.

On site tests done in "Frame Mode" for TS12 & TS18 cleared the comments on Comtech/IDC/NTT decoders in regards to "ASI loop issues".

Telesat notes regarding the retest do not indicate all decoder vendors were re-evaluated at the time of the retest. The results noted below for Thomson 1080i files will remain for the "auto-field mode" submitted files.

Transport Stream Submittal Matrix

 Dolby streams recorded or re-recorded on site
 Submitted TS streams

Vendors	Decoders	TS1	Adtec	Ateme	x	x	Fujitsu	x	NTT	Cisco	x	x
		TS2	Adtec	Ateme	x	x	Fujitsu	x	NTT	Cisco	x	Thomson
Adtec Digital	AEME	TS3	x	Ateme	x	x	Fujitsu	x	NTT	x	x	Thomson
AEME	ComtechTV	TS4	Adtec	Ateme	x	x	Fujitsu	x	NTT	Cisco	x	Thomson
ComtechTV	Evertz	TS5	Adtec	Ateme	x	x	Fujitsu	x	NTT	x	x	Thomson
Evertz	Fujitsu	TS6	x	Ateme	Comtech	x	x	Harmonic	x	Cisco	Tandberg	Thomson
Fujitsu	Int. Datacasting	TS7	Adtec	Ateme	Comtech	x	Fujitsu	Harmonic	NTT	Cisco	Tandberg	Thomson
Harmonic	NTT Electronics	TS8	Adtec	x	x	Evertz	Fujitsu	Harmonic	NTT	Cisco	Tandberg	Thomson
Int. Datacasting	Cisco	TS9	Adtec	Ateme	x	x	Fujitsu	Harmonic	NTT	x	x	Thomson
NTT Electronics	Sencore	TS10	x	Ateme	x	x	Fujitsu	Harmonic	NTT	Cisco	Tandberg	Thomson
Cisco	Tandberg	TS11	Adtec	Ateme	x	Evertz	Fujitsu	x	NTT	Cisco	x	Thomson
Sencore	Thomson	TS12	x	Ateme	x	Evertz	x	Harmonic	x	x	Tandberg	Thomson
Tandberg		TS13	x	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	x	Tandberg	Thomson
Thomson		TS14	x	Ateme	x	Evertz	x	Harmonic	x	Cisco	Tandberg	Thomson
		TS15	Adtec	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	Cisco	Tandberg	Thomson
		TS16	x	Ateme	x	Evertz	x	Harmonic	x	x	Tandberg	Thomson
		TS17	Adtec	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	x	Tandberg	Thomson
		TS18	x	Ateme	Comtech	Evertz	x	Harmonic	x	Cisco	Tandberg	Thomson
		TS19	Adtec	Ateme	Comtech	Evertz	Fujitsu	Harmonic	NTT	Cisco	Tandberg	Thomson
		TS20	x	Ateme	x	Evertz	x	Harmonic	x	x	Tandberg	Thomson
		TS21	Adtec	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	x	Tandberg	Thomson
		TS22	x	Ateme	x	Evertz	x	Harmonic	x	Cisco	Tandberg	Thomson
		TS23	Adtec	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	Cisco	Tandberg	Thomson
		TS24	Adtec	x	x	x	Fujitsu	x	NTT	x	x	x
		TS25	Adtec	Ateme	x	x	Fujitsu	Harmonic	NTT	Cisco	x	x
		TS26	x	Ateme	x	x	Fujitsu	Harmonic	NTT	Cisco	Tandberg	Thomson
		TS27	x	Ateme	x	Evertz	x	Harmonic	x	x	x	Thomson
		TS28	Adtec	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	x	Tandberg	Thomson

TS1		TS1	Adtec	Ateme	x	x	x	x	NTT	x	x	x
AEME												
ComtechTV			NS	NS					NS			
Evertz			NS	NS					NS			
Fujitsu			NS	NS					NS			
Int. Datacasting			NS	NS					NS			
NTT Electronics			1	1					OK			
Cisco			NS	NS					NS			
Sencore			NS	NS					NS			
Tandberg			NS	NS					NS			
Thomson			NS	NS					NS			

1 freeze frames at identical points in video

TS2	TS2	Adtec	Ateme	x	x	x	x	NTT	Cisco	x	Thomson
AEME											
ComtechTV		1	OK					OK			4
Evertz		OK	OK					OK			OK
Fujitsu		2	OK					OK			2
Int. Datacasting		1	OK					OK			5
NTT Electronics		1	OK					OK			OK
Cisco		OK	OK					OK			OK
Sencore		1	OK					OK			OK
Tandberg		OK	1					OK			OK
Thomson		OK	OK					OK			OK

1 freeze frames, breakups and blocking

3 footnote deleted

2 no usable picture

4 OK on first pass, increasing artifacts with each loop

5 OK on first pass, then requires reset

Based on subsequent analysis, there may have been issues with the Adtec Transport Stream leading to inconsistent results.

TS3	TS3	x	Ateme	x	x	x	x	NTT	x	x	Thomson
AEME											
ComtechTV			NS					NS			4
Evertz			NS					NS			OK
Fujitsu			NS					NS			3
Int. Datacasting			NS					NS			1
NTT Electronics			OK					OK			OK
Cisco			NS					NS			OK
Sencore			NS					NS			OK
Tandberg			NS					NS			OK
Thomson			NS					NS			OK

1 OK on first pass, then requires reset

2 comment deleted

3 no usable picture

4 OK on first pass, increasing artifacts with each loop

TS4	TS4	Adtec	Ateme	x	x	x	x	NTT	x	x	Thomson
AEME											
ComtechTV		NS	NS					NS			2
Evertz		NS	NS					NS			OK
Fujitsu		NS	NS					NS			3
Int. Datacasting		NS	NS					NS			1
NTT Electronics		OK	OK					OK			OK
Cisco		NS	NS					NS			OK
Sencore		NS	NS					NS			OK
Tandberg		NS	NS					NS			OK
Thomson		NS	NS					NS			OK

1 OK on first pass, temporary errors at loop point

3 flashbacks to colorbars

2 OK on first pass, increasing artifacts with each loop

TS5		TS5	Adtec	Ateme	x	x	x	x	NTT	x	x	Thomson
AEME												
ComtechTV			NS	NS					NS			4
Evertz			NS	NS					NS			OK
Fujitsu			NS	NS					NS			5
Int. Datacasting			NS	NS					NS			3
NTT Electronics			1	OK					2			OK
Cisco			NS	NS					NS			OK
Sencore			NS	NS					NS			OK
Tandberg			NS	NS					NS			OK
Thomson			NS	NS					NS			OK

1 video OK, freezing on colorbar only

2 video OK, very long delay before colorbar display

3 OK on first pass, temporary errors at loop point

4 OK on first pass, increasing artifacts with each loop

5 flashbacks to colorbars

TS6	TS6	x	Ateme	Comtech	x	x	Harmonic	x	Cisco	Tandberg	Thomson
AEME											
ComtechTV			NS	OK			OK		OK	OK	5
Evertz			NS	OK			OK		OK	OK	OK
Fujitsu			NS	OK			2		3	OK	3
Int. Datacasting			NS	OK			7		OK	OK	6
NTT Electronics			OK	OK			OK		4	OK	NS
Cisco			NS	OK			8		OK	OK	OK
Sencore			NS	OK			OK		OK	OK	OK
Tandberg			NS	1			OK		OK	OK	OK
Thomson			NS	OK			OK		OK	OK	OK

1 occasional loss of video

2 no picture

3 frequent blocking, some freezing

4 very long delay (40sec) before resyncing after colourbar

5 OK on first pass, increasing artifacts with each loop

6 OK on first pass, then requires reset

7 problem syncing to TS

8 OK on first pass, then black until reset

TS7	TS7	Adtec	Ateme	Comtech	x	Fujitsu	Harmonic	NTT	Cisco	Tandberg	Thomson
AEME											
ComtechTV		NS	NS	OK		OK	OK	NS	OK	OK	5
Evertz		NS	NS	OK		OK	OK	NS	OK	OK	OK
Fujitsu		NS	NS	OK		OK	OK	NS	OK	OK	6
Int. Datacasting		NS	NS	OK		OK	2	NS	OK	OK	7
NTT Electronics		1	OK	OK		OK	3	OK	OK	OK	OK
Cisco		NS	NS	OK		OK	4	NS	OK	OK	OK
Sencore		NS	NS	OK		OK	OK	NS	OK	OK	OK
Tandberg		NS	NS	OK		OK	OK	NS	OK	OK	OK
Thomson		NS	NS	OK		OK	OK	NS	OK	OK	OK

1 freezing on colorbar, and at identical points in video

2 problem syncing to TS

3 brief blocking artifact at repeatable point

4 OK on first pass, then black until reset

5 OK on first pass, increasing artifacts with each loop

6 occasional widespread blocking

7 OK on first pass, then requires reset

TS11	TS11	Adtec	Ateme	x	Evertz	Fujitsu	x	NTT	Cisco	x	x
ATEME											
ComtechTV		OK	OK		OK	OK		OK	OK		
Evertz		OK	OK		OK	1		OK	OK		
Fujitsu		OK	OK		OK	OK		OK	OK		
Int. Datacasting		OK	OK		OK	OK		OK	OK		
NTT Electronics		OK	OK		OK	OK		OK	OK		
Cisco		OK	OK		OK	OK		OK	OK		
Sencore		OK	OK		OK	OK		OK	OK		
Tandberg		OK	OK		OK	OK		OK	OK		
Thomson		OK	OK		OK	OK		OK	OK		

1 blocking in video

2 OK on first pass, then requires reset

3 frequent blocking in video

4 freezing, blocking during first 60 sec after each loop

5 OK on first pass, increasing artifacts with each loop

TS12	TS12	x	Ateme	x	Evertz	x	Harmonic	x	x	Tandberg	Thomson
AEME											
ComtechTV			NS		OK		OK			OK	5
Evertz			NS		OK		OK			OK	OK
Fujitsu			NS		OK		1			1	1
Int. Datacasting			NS		OK		2			OK	6
NTT Electronics			OK		OK		OK			OK	4
Cisco			NS		OK		3			OK	OK
Sencore			NS		OK		OK			OK	OK
Tandberg			NS		OK		OK			OK	OK
Thomson			NS		OK		OK			OK	OK

1 occasional blocking & jerky motion

2 problem syncing to TS

3 OK on first pass, then black until reset

4 no video in first third of sequence, on all passes

5 OK on first pass, increasing artifacts with each loop

6 OK on first pass, then requires reset

TS13	TS13	x	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	x	Tandberg	Thomson
AEME											
ComtechTV			NS		OK	OK	2	NS		OK	4
Evertz			NS		OK	OK	OK	NS		OK	OK
Fujitsu			NS		OK	OK	3	NS		OK	5
Int. Datacasting			NS		OK	OK	8	NS		OK	7
NTT Electronics			OK		OK	OK	3	OK		OK	OK
Cisco			NS		OK	OK	1	NS		OK	OK
Sencore			NS		OK	OK	OK	NS		OK	OK
Tandberg			NS		OK	OK	OK	NS		OK	OK
Thomson			NS		OK	OK	OK	NS		OK	OK

1 OK on first pass, then black until reset

2 colourbar flash during video

3 single judder event (frame freeze/jump)

4 OK on first pass, increasing artifacts with each loop

5 occasional blocking in video

7 OK on first pass, then requires reset

8 problem syncing to TS

TS14	TS14	x	Ateme	x	Evertz	x	Harmonic	x	Cisco	Tandberg	Thomson
AEME											
ComtechTV			NS		OK		OK		OK	OK	5
Evertz			NS		OK		OK		OK	OK	OK
Fujitsu			NS		OK		OK		2	OK	OK
Int. Datacasting			NS		OK		6		OK	OK	4
NTT Electronics			OK		OK		OK		3	OK	OK
Cisco			NS		OK		1		OK	OK	OK
Sencore			NS		OK		OK		OK	OK	OK
Tandberg			NS		OK		OK		OK	OK	OK
Thomson			NS		OK		OK		OK	OK	OK

1 OK on first pass, then black until reset

2 constant severe blocking

3 no video

4 OK on first pass, temporary errors at loop point

5 OK on first pass, increasing artifacts with each loop

6 problem syncing to TS

TS15	TS15	Adtec	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	Cisco	Tandberg	Thomson
AEME											
ComtechTV		OK	NS		OK	OK	OK	NS	OK	6	7
Evertz		OK	NS		OK	OK	OK	NS	OK	5	OK
Fujitsu		OK	NS		OK	OK	3	NS	OK	4	3
Int. Datacasting		OK	NS		OK	OK	9	NS	OK	OK	8
NTT Electronics		OK	OK		OK	OK	OK	OK	OK	5	OK
Cisco		OK	NS		OK	OK	2	NS	OK	OK	OK
Sencore		OK	NS		OK	OK	OK	NS	OK	OK	OK
Tandberg		OK	NS		OK	OK	OK	NS	OK	OK	OK
Thomson		OK	NS		OK	OK	OK	NS	OK	OK	OK

1 deleted footnote

2 OK on first pass, then black until reset

3 flashbacks to colorbar

4 flashbacks to previous video material

5 video OK, but problems during colorbar

6 freeze frame in colorbar and once in video

7 OK on first pass, increasing artifacts with each loop

8 OK on first pass, temporary errors at loop point

9 problem syncing to TS

TS16	TS16	x	Ateme	x	Evertz	x	Harmonic	x	x	Tandberg	Thomson
AEME											
ComtechTV			NS		OK		OK			OK	3
Evertz			NS		OK		OK			OK	OK
Fujitsu			NS		OK		OK			OK	OK
Int. Datacasting			NS		OK		5			OK	4
NTT Electronics			OK		OK		OK			OK	OK
Cisco			NS		OK		2			OK	OK
Sencore			NS		OK		OK			OK	OK
Tandberg			NS		OK		OK			OK	OK
Thomson			NS		OK		OK			OK	OK

1 footnote deleted

2 OK on first pass, then black until reset

3 OK on first pass, increasing artifacts with each loop

4 OK on first pass, temporary errors at loop point

5 problem syncing to TS

TS17	TS17	Adtec	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	x	Tandberg	Thomson
AEME											
ComtechTV		NS	NS		OK	OK	2	NS		OK	6
Evertz		NS	NS		OK	OK	3	NS		OK	OK
Fujitsu		NS	NS		OK	OK	2	NS		OK	2
Int. Datacasting		NS	NS		OK	OK	4	NS		OK	7
NTT Electronics		OK	OK		OK	OK	OK	OK		OK	OK
Cisco		NS	NS		OK	OK	5	NS		OK	OK
Sencore		NS	NS		OK	OK	OK	NS		OK	OK
Tandberg		NS	NS		OK	OK	OK	NS		OK	OK
Thomson		NS	NS		OK	OK	OK	NS		OK	OK

1 footnote removed
2 flashbacks to colorbar

3 video judder
4 problem syncing to TS
5 OK on first pass, then black until reset

6 OK on first pass, increasing artifacts with each loop
7 OK on first pass, temporary errors at loop point

TS18	TS18	x	Ateme	x	x	Fujitsu	x	NTT	x	x	Thomson
AEME											
ComtechTV			OK	OK	OK		OK		OK	OK	7
Evertz			OK	OK	OK		OK		OK	5	5
Fujitsu			OK	OK	OK		2		4	OK	4
Int. Datacasting			OK	OK	OK		3		OK	OK	8
NTT Electronics			OK	OK	OK		OK		OK	6	2
Cisco			OK	OK	OK		9		OK	OK	OK
Sencore			OK	OK	OK		OK		OK	OK	OK
Tandberg			OK	OK	OK		OK		OK	OK	OK
Thomson			OK	OK	OK		OK		OK	OK	OK

1 footnote removed
2 no video
3 problem syncing to TS

4 continuous blocking and freeze frames
5 picture occasionally freezes 5 seconds after loop
6 brief blocking at repeatable video location

7 OK on first pass, increasing artifacts with each loop
8 OK on first pass, then requires reset
9 OK on first pass, then black until reset

TS19	TS19	Adtec	Ateme	Comtech	Evertz	Fujitsu	Harmonic	NTT	Cisco	Tandberg	Thomson
AEME											
ComtechTV		1	OK	OK	OK	OK	OK	OK	OK	OK	7
Evertz		OK	OK	OK	OK	3	OK	OK	OK	OK	OK
Fujitsu		OK	OK	OK	OK	OK	1	OK	OK	OK	6
Int. Datacasting		OK	OK	OK	OK	OK	10	OK	OK	OK	8
NTT Electronics		OK	OK	OK	OK	OK	OK	OK	OK	OK	5
Cisco		OK	OK	OK	OK	OK	9	OK	OK	OK	OK
Sencore		OK	OK	OK	OK	OK	8	OK	OK	OK	OK
Tandberg		OK	OK	8	OK	OK	OK	OK	OK	OK	OK
Thomson		OK	OK	OK	OK	OK	8	OK	OK	OK	OK

1 occasional freeze frames
2 deleted footnote
3 some blockiness in video

4 deleted footnote
5 colorbar flashbacks in video
6 widespread blocking

7 OK on first pass, increasing artifacts with each loop
8 OK on first pass, then requires reset
9 OK on first pass, then black until reset

10 problem syncing to TS

TS20	TS20	x	Ateme	x	Evertz	x	Harmonic	x	x	x	Thomson
AEME											
ComtechTV			OK		OK		OK				5
Evertz			OK		OK		OK				OK
Fujitsu			OK		OK		1				3
Int. Datacasting			OK		OK		2				6
NTT Electronics			OK		OK		OK				4
Cisco			OK		OK		7				OK
Sencore			OK		OK		OK				OK
Tandberg			OK		OK		OK				OK
Thomson			OK		OK		OK				OK

1 no video

2 problem syncing to TS

3 widespread blocking

4 long resync period (40 sec) on each pass, then video OK

5 OK on first pass, increasing artifacts with each loop

6 OK on first pass, then requires reset

7 OK on first pass, then black until reset

TS21	TS21	Adtec	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	x	Tandberg	Thomson
AEME											
ComtechTV		1	OK		OK	OK	5	OK		OK	10
Evertz		1	OK		OK	4	OK	OK		OK	OK
Fujitsu		1	OK		OK	OK	6	OK		OK	3
Int. Datacasting		2	OK		OK	OK	7	OK		OK	11
NTT Electronics		3	OK		OK	OK	8	OK		OK	9
Cisco		1	OK		OK	OK	12	OK		OK	OK
Sencore		1	OK		OK	OK	OK	OK		OK	OK
Tandberg		OK	OK		OK	OK	OK	OK		OK	OK
Thomson		OK	OK		OK	OK	OK	OK		OK	OK

1 continuous freeze frames 4 some blocking in video 7 problem syncing to TS 10 OK on first pass, increasing artifacts with each loop
 2 mild vertical jitter 5 colorbar flashbacks 8 blocking and freeze frames for 1 second during video 11 OK on first pass, then requires reset
 3 widespread blocking 6 no video 9 occasional freeze frames 12 OK on first pass, then black until reset

Based on subsequent analysis, there may have been issues with the Adtec Transport Stream leading to inconsistent results.

TS22	TS22	x	Ateme	x	Evertz	x	Harmonic	x	Cisco	Tandberg	Thomson
AEME											
ComtechTV			OK		OK		OK		OK	OK	4
Evertz			OK		OK		OK		OK	OK	OK
Fujitsu			OK		OK		1		3	OK	OK
Int. Datacasting			OK		OK		2		OK	OK	OK
NTT Electronics			OK		OK		OK		1	OK	OK
Cisco			OK		OK		6		OK	OK	OK
Sencore			OK		OK		6		OK	OK	OK
Tandberg			OK		OK		OK		OK	OK	OK
Thomson			OK		OK		6		OK	OK	OK

1 No video

2 problem syncing to TS

3 widespread blocking

4 OK on first pass, increasing artifacts with each loop

5 OK on first pass, temporary errors at loop point

6 OK on first pass, then black until reset

TS23	TS23	Adtec	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	Cisco	Tandberg	Thomson
AEME											
ComtechTV		OK	OK		OK	OK	1	OK	OK	6	7
Evertz		OK	OK		OK	OK	OK	OK	OK	OK	OK
Fujitsu		OK	OK		OK	OK	2	OK	5	6	6
Int. Datacasting		OK	OK		OK	OK	9	OK	OK	OK	8
NTT Electronics		OK	OK		OK	OK	OK	OK	2	OK	OK
Cisco		OK	OK		OK	OK	3	OK	OK	OK	OK
Sencore		OK	OK		OK	OK	OK	OK	OK	OK	OK
Tandberg		OK	OK		OK	OK	OK	OK	OK	OK	OK
Thomson		OK	OK		OK	OK	OK	OK	OK	OK	OK

1 colorbar flash in video shortly after loop point

2 no video

3 OK on first pass, then black until reset

4 deleted footnote

5 widespread blocking

6 flashbacks to previous video frames

7 OK on first pass, increasing artifacts with each loop

8 OK on first pass, temporary errors at loop point

9 problem syncing to TS

TS27	TS27	x	Ateme	x	Evertz	x	Harmonic	x	x	Tandberg	Thomson
AEME											
ComtechTV			OK		OK		OK			OK	4
Evertz			OK		OK		OK			OK	OK
Fujitsu			OK		OK		2			OK	OK
Int. Datacasting			OK		OK		6			OK	5
NTT Electronics			OK		OK		OK			OK	OK
Cisco			OK		OK		3			OK	OK
Sencore			OK		OK		OK			OK	OK
Tandberg			OK		OK		OK			OK	OK
Thomson			OK		OK		OK			OK	OK

1 footnote removed

2 no video

3 OK on first pass, then black until reset

4 OK on first pass, increasing artifacts with each loop

5 OK on first pass, temporary errors at loop point

6 problem syncing to TS

TS28	TS28	Adtec	Ateme	x	Evertz	Fujitsu	Harmonic	NTT	x	Tandberg	Thomson
AEME											
ComtechTV		OK	OK		OK	OK	2	OK		2	5
Evertz		OK	OK		OK	OK	OK	OK		OK	OK
Fujitsu		OK	OK		OK	OK	3	OK		2	2
Int. Datacasting		OK	OK		OK	OK	7	OK		OK	6
NTT Electronics		OK	OK		OK	OK	OK	OK		OK	OK
Cisco		OK	OK		OK	OK	4	OK		OK	OK
Sencore		OK	OK		OK	OK	OK	OK		OK	OK
Tandberg		OK	OK		OK	OK	OK	OK		OK	OK
Thomson		OK	OK		OK	OK	OK	OK		OK	OK

1 footnote removed
2 colorbar flashbacks
3 no video

4 OK on first pass, then black until reset
5 OK on first pass, increasing artifacts with each loop
6 OK on first pass, temporary errors at loop point
7 problem syncing to TS