

ATC Working Group Meeting
June 15-16, 2005 – Transtar

1 Introduction

1.1 General

The following are minutes and notes from the ATC *Controller Working Group* meeting. The meeting was held with 2 principle items on the agenda:

- Review of the ATC-2070 standard and
- Review of the NEMA Task Force revisions to the ATC V5.0 document approved in concept at the previous ATC working group meeting.

Harris County was our host at the TranStar TMC. The meeting was called to order at 8:30 AM by the working group chair, John Renfro (KY); James Cheeks introduced the rules of the meeting followed by self introductions.

These meeting minutes include the specific topics discussed, and the resolution to the various issues raised during the meeting – based on documents submitted during the review period.

1.2 ATC V5.0 background

The ATC V5.0 standard was originally developed as a joint effort by ITE, NEMA, and AASHTO and was finalized in the fall of 2003. This work was begun in the fall (November) of 2002 as a part of an expedited effort to complete critical standards. The expedited effort used a contract issued to Siemens [by ITE] to complete the development of the new ATC standard. This work was carried out through 2003 and the final product, Version 5.0, was balloted by the ATC Joint Committee, AASHTO, and NEMA in the fall of 2003. The ITE formal “*Notice Of Intent To Adopt*” received several appeals. These were discussed at an ATC Joint Committee meeting in the spring of 2004 and a number of changes were proposed to the standard (V5.0); the joint committee approved the proposed revisions to the standard and directed that they be completed, but suggested that they be coordinated with the NEMA comments. NEMA voted to reject the standard and provided a list of the “*issues*” that had to be resolved.

NEMA then formed a task force to develop resolutions to the issues raised by its members. The task force presented their proposed changes during an ATC working group meeting held in San Diego at the end of March, 2005. During that meeting, there was general consensus within the working group as to the proposed resolutions (an issue-resolution table was delivered) based on a presentation by Dave Miller, Siemens ITS.

The Standard was then to be modified by Siemens and the result was to be delivered to the working group for final review so that it could be finalized and re-submitted to both NEMA and ITE as the resolution to the appeals issues.

Many of the proposed changes (from the March 2005 meeting) had not been made and some additional “changes” not part of the original NEMA resolution had also been introduced to the standard. In addition, one of the main issues that was agreed to in principle, the *Board Support Package* (BSP), had not been completed for review at the San Diego ATC meeting in March.

This June 15-16, 2005 working group meeting reviewed the NEMA proposed changes, reconciled the other changes suggested, and attempted to work through the details of the BSP.

2 Attendees:

The following were present during some or all of the working group meeting.

<u>Person</u>	<u>Organization</u>	<u>Person</u>	<u>Organization</u>
James Cheeks	ITE	Vicki Scohfield	NEMA
Blake Christie	Mitretek	Ed Fok	FHWA
John Renfro	KyDOT	Ron Johnson	Transtar
Henry Wickes	TxDOT	Richard Dickinson	Houston
George Chen	LADOT	Ken Montgomery	GDOT
John Thai	Anaheim	Floyd Workmon	Consultant/CALTRANS
Scott Evans	EDI	Bob Rausch	TransCore
Jim Rose	Econolite	Peter Ragsdale	US Traffic (USTC)
Ralph Boaz	Consultant	Clyde Neel	Naztec
Bob Russo	Safetran	Ray Deer	Peek
Alan Clelland	Siemens	Doug Tarico	Siemens
Dave Miller	Siemens	Montasir Abbas	TTI
Srinivasa Sunkari	TTI		

3 Program Discussion By James Cheeks

James asked participants to respond to the email on **new work items** and provide feedback (needs/changes) based on deployments. This input will then be developed by the committee chairs and the ATC steering committee chair to develop the ATC work plan for the coming years.

James asked for input on the testing program, a more urgent focus of the FHWA. He noted that Battelle is “re-launched” and we need to provide input to the process.

James asked the working group to provide issues and feedback through the SDO’s and not a direct Blitz to the list serve. ATC working group members were asked to respond to James; Vicki noted that NEMA had made a similar request to its NEMA members.

James noted that the FHWA Standards focus is on the completion of deliverables. He indicated that there will be no support for meetings if there is nothing on the funded schedule that needs work. BUT, we don’t get new funding until the previously funded effort/projects has been completed.

It is likely that the initiatives will request support from the standards program to facilitate their deployment needs. Both the ETO and the ICM initiatives have included tasks to coordinate with the Standards working groups were needed.

4 Schedule and issue discussion

At the conclusion of the working group meeting, the following issues were discussed with regard to completing the work – which must include a published standard by the end of the year.

4.1 Schedule

Date	Event
June 21	Boaz to provide paragraph and picture to describe the role of the BSP; Rausch to provide input on clock/RTC issue for inclusion in both the 2070 and the ATC standard.
June 30	BSP and full revised V5.1 sent out to ATC.ALL for review and comments. The final version is to be worked between Peter and Dave such that it is complete and finalized by this date. Comments are to be restricted to the changes introduced for the resolution of the NEMA and ITE appeals.
July 14	Comments due from all parties
July 18	Document submitted to NEMA to address comments; NEMA to work with the ATC and API working groups to address comments.
August 1	Final version to be presented to the ATC Working group along with all comments and comment resolutions.
August 15	Approval of the working group. Document to be submitted to the joint committee for approval
September 1	Joint committee review and approval – possible recommendations for intent to adopt or go to publication or re-circulate for UCD.
September 1	Formal Ballot process started for AASHTO and ITE depending on what is required based on degree of standards.

4.2 Next steps discussion

API working group needs to review the revised ATC document to ensure acceptability of the BSP shown in appendix A and B. The ATC working group does not want to re-circulate the complete document for a complete UCD because if this is done, then comments on other sections of the document must be allowed and resolved before it can move forward for approval and publication.

Plan A – submit Appendix A and B to the API working group. If Appendix B comments are extensive – then the ATC will delete appendix B if they do not agree. It was agreed that the working group needs to set the context for the Appendix review and circulate to ATC.ALL for review.

5 2070 update – Peter Ragsdale

Peter Ragsdale (USTC) took over responsibility for updates to the ATC-2070 standard. He entered 385 comments into the comment database because the database was not available except in pdf format.

He has been updating the document based on: 1) the comment database, and 2) the CALTRANS Errata 1 for the 2070. He is not working with the CALTRANS Errata 2.

Peter noted that he only had the pdf files for the drawings and not the original files drawing files (visio or dwg); **ACTION: Peter requested assistance from Ron Johnson to obtain electronic copies of the drawings.**

Peter noted that the NEMA section needs considerable work and asked for a quick response group to review the NEMA issues. He noted that CALTRANS had not really focused on any of the NEMA issues and we now need to address those. The following people “volunteered” to be members of the quick response group: Jim Rose, Clyde Neal, Ron Johnson, Dave Miller, John Thai, Richard Dickinson; it appears that 60-70 comments need resolution and clarification.

ACTION: This group has scheduled a **July 6 (2:00 PM Eastern) conference call** to discuss/propose resolution to the issues; **ACTION: Peter promised that the NEMA comment database will be sent out on June 22 in preparation for that call.**

CALTRANS has asked that the working group delay their changes until they [CALTRANS] can complete their current project/procurement – which should be by the end of July. Floyd suggested that Peter go directly to Jeff McRae for commitments on the CALTRANS updates and a schedule so that we can coordinate our completion of the ATC-2070 national standard. There was considerable discussion regarding the coordination with the current CALTRANS procurement efforts; CALTRANS is making changes to their current 2070 standard to clarify the standard which is likely to affect interchangeability. It was suggested that there needed to be a more formal contact between the ATC program and CALTRANS to coordinate these efforts and ensure a coordination of schedules. If CALTRANS is not committed to completing their changes by the end of July, then the ATC working group may be required to proceed without their [CALTRANS] input to complete the standard. **ACTION: Peter to make initial contact and to report to the ATC working group chair.**

ACTION: Peter is committed to a UCD by the end of August. The working group needs to make formal contact with CALTRANS. Peter committed to contacting Jeff McRae to attempt to coordinate the development. James indicated that he will initiate the discussions with AASHTO and the joint committee regarding coordination of this work.

SIU discussion; Scott Evans noted that there is a need to update the ATC-2070 to reflect the cumulative changes to the SIU communications and operation that has been included in the ITS cabinet standard. Scott noted that many of the changes may not be documented in the “user comments database” and hence someone [Peter] needs to review the current (modified) version of the Cabinet Standard (SIU) and update the ATC-2070 to match. Note that changes were made to the SIU because it is a new product; changes to the Field I/O module must be done more carefully since it will affect existing product. **ACTION: Peter to review and incorporate the necessary changes.**

Peter committed to releasing the revised ATC-2070 standard in segments for feedback from the working group. **ACTION: Everyone will be required to review the pieces as they come out and provide the feedback so that Peter can complete the UCD for the August 30 Schedule.**

5.1 NEMA version issues

At the end of the ATC working group meeting, Peter asked for some initial feedback and input on a number of issues he had discovered with the TEES and previous ATC-2070 standard. Only a few of those are listed briefly below.

There is a need to change designation on the connectors from the 2070 due to inconsistencies.

The 2N version is not pictured, and it needs to be; Peter to propose a resolution and pictures.

The revised standard will allow a combo (Philips and slotted) thumb screw – CALTRANS mandates a slotted by part number.

Which port will be supported for the 485? The general consensus at the meeting was port 5; Peter to clarify with CALTRANS and the other manufacturers.

Section 11.4.9 – “jumper selection a baud rate” – where does this port connect? Seems that what is defined will be electrically interchangeable and there is currently not required use. The standard will remain unchanged.

Section 5 general – while there is a requirement that the opto isolation support 1 Mb for the 485 lines, there is no requirement for the EIA 232 drivers; it was suggested that the EIA 232 drivers should be capable of 115.2 Kbps as a minimum.

ACTION: As noted above, Peter will be asking for review by the NEMA rapid response group to review the total list (June 22) and participate in the July 6 teleconference.

ACTION: James Cheeks to arrange for teleconference and notify rapid response group.

6 ATC Review

The NEMA list of changes from January 31, 2005 was agreed to by both the NEMA task force and the ATC working group during the last meeting (March 2005). The task for this meeting was to incorporate the NEMA/ATC working group approved changes into the standard.

At the last meeting – many of the agreed changes were high level. Example: the details for the BSP were only available during the last few weeks and were only provided to the ATC working group on the evening of June 14, 2005. Appendix A and B was reviewed at the meeting. The NEMA task force must approve the proposed changes of the ATC working group to be accepted by NEMA. Likewise, the ATC working group must accept the NEMA changes in order to move the standard forward. It was agreed that, the following sequence would be followed during the meeting:

- First step – Dave Miller to walk through the changes with the working group
- Second step – identify changes not made – Peter Ragsdale and accept/reject proposed resolution.
- Third step – discussion of the BSP details based on the input from Ray Deer and Peter Ragsdale.

6.1 Dave Miller's review of the document

The working group traced through the proposed changes by Dave Miller. All of the changes were generally accepted subject to the more detailed review by Peter, Ray Deer, and Jim Rose that follows.

The agreed time to load, start, and turn over execution to the application was 4.5 seconds in the original ATC standard. Dave had adjusted this to 10 seconds; that change was not authorized by the working group and was not part of the appeals issues from either NEMA or the ITE and hence there was no cause for the proposed change. Further Peter indicated that it was possible to meet the 4.5 second requirement and the anticipated problem is more likely associated with the number of utilities and method used to load Linux and the drivers. **ACTION:** this is a new change that will not be accepted; the 4.5 second requirement stays in the standard.

6.2 Review of Peter's comments to the NEMA task group on the ATC standard.

Unless otherwise noted below, all of Peter's comments were accepted by the working group.

Editorial Comments (2 tables)

Section	Page	Line #s	Issue	Recommendation
Table of	i-ix	n/a	Several section headings in the Table of Contents	Correct Table of Contents including headings and page numbers. Also fix page

Contents			do not agree with the actual heading titles in the body of the document plus some page numbers are wrong. For example, section 2.2.5 is actually "Operating System & Board Support Package Requirements" and starts on page 2-4.	numbers so that they are all right justified (e.g. section 9.10 & figure 8-23 are not) ACCEPTED	
Table of Contents	Viii	n/a	Appendix A & B are missing	Add Appendix A & B to Table of Contents ACCEPTED	
2	2-1	n/a	Page Header has Section labeled as "FORWARD"	Correct Header as required. ACCEPTED	
2.1	2-2	Drawing	Date is wrong	Update date appropriately ACCEPTED	
2.1	2-3	1	Figure heading needs to be below the figure	Move heading to the same page as the figure. ACCEPTED	
5.3.3	5-7	4	Typo	Correct spelling of "Dhrystone" ACCEPTED	
5.4.3	5-15	19-20	Change text for consistency within section.	Change "Output" to "(O)" in line 19 Change "Input" to "(I)" in line 20 ACCEPTED	
7	"7-21"	--	Section incorrectly starts on page 7-19 instead of page 7-1	Correct page numbering of section 7. This editorial comment is still not corrected (section numbering should start at 7-1). ACCEPTED	
6.2.2	6-4	27-28	Typos	Change "SP3TX1+" to "SP3TXCI+" on line 27 Change "SP3TXC1-" to "SP3TXCI-" on line 28 Note it is a letter "I" at the end (and not a one) ACCEPTED	
6.2.2	6-5	24-25	Typos	Change "SP3TX1+" to "SP3TXCI+" on line 24 Change "SP3TXC1-" to "SP3TXCI-" on line 25 Note it is a letter "I" at the end (and not a one) ACCEPTED	
3	3-1	22	Typos	Change "are" to "as" ACCEPTED	
Comment #	Section	Page	Line #s	Issue	Recommendation
Ballot #11	7.1.3	7-23	7-8	C50 Enabled is now present ... this guidance must be reworded	Reword text to indicate that C50 Enabled is now present and then when active communications to all other SP4 ports is cut-off completely (per TEES no

					other port will transmit, and no other received data is presented to the Engine Board). The word "other" was missed and needs to be added. Also define asserted as active low. For example, change text to "... is asserted (active low), ..." ACCEPTED
Ballot #24	2.3.1	2.8	11	Reference to NEMA TS 2 should not be removed	Reinsert reference to NEMA TS 2-2002 (without pending text). Sorry ... reference needs to be TS 2-2003. ACCEPTED

6.3 Previous Technical Comments from Peter that were not included.

Section	Page	Line #s	Issue	Recommendation
2.1	2-2	drawing	Comm slot A1 is missing	Add reference to connector A1 in drawing. Figure 2-1 needs to have the text in the box "COMMUNICATIONS INTERFACE CONNECTOR" modified to be the following: "COMMUNICATIONS INTERFACE CONNECTOR(S) For Model 2070 Modem Modules, see Section 6.2.2 for pin list" since we now have pin-outs defined for both the A1 & A2 configurations. ACCEPTED
2.2.5	2-5	top table	File system added for SRAM The revised version is acceptable.	This is new and needs discussion. The requirement for SRAM is to provide non-volatile parameter storage. The addition of the BSP suggested that a file system be used. Is this acceptable to all as it differs from the way a 2070 handles it. Rejected
2.2.5	2-7	3	SP4 is used for Comm slot A1. This is a concern since Users are expecting their 2070 modem modules to work correctly within the ATC. To Be resolved – either there is a need for the port or not.	We need a method to use "SP4" for communications per 2070. I am highly concerned about dedicating SP4 for the Operating System. This was not identified to the ATC WG or in the NEMA Task Group Resolutions of Jan 31, 2005. A discussion is required (e.g. is this only in place for O/S boot, or does SP4 remain tied to the Operating System as the Console. Rejected Serial Drivers will be modified to support the ATC – this port must be able to support shell break-in as well as application – but unsure. Likely an initialization issue – so will keep wording as is – port count is fine.
5.2.1	5-3	Fig 5-1	Location of both P2 and P1 plus the Equipment Ground plated through hole need to be identified. Most people	Add text to drawing to identify P1, P2, and Equipment Ground hole. The Equipment Grounding hole is in the wrong location on the drawing. Resolution was that it was below P2

			would assume P1 on left when actually P2 is on the left.	as correctly described in Section 5.4.5. Text is wrong and drawing is correct – to be fixed accordingly. ACCEPTED
5.4.1	5-9	17	This text needs correcting per a ballot comment. In general, the test procedure has to measure the sum of the RTC and SRAM and not just reference one of the readings (selected by the manufacturer).	Change text to adopt that agreed in resolution Point #2 to comment #New 9. Resolution is that value should be 6.0 uA (and not 4.0 uA as currently written). This is also Ballot comment #New 9. ACCEPTED
5.4.3	5-13	1-35	Baud rates are wrong ... 57.6k and 115.2k are optional per Ballot comments, and SP8 is ASYNC only	Correct per Ballot Comments. SP3 needs to have 57.6k and 115.2 listed as Optional (not mandatory), and both SP4 and SP6 need 57.6k and 115.2 added as optional. Procurement discussion needs to identify options. ACCEPTED
5.4.3	5-14	19	Currently, the BSP section does not define the content or format of the Host Module serial EEPROM	Define the content and organization of the controller configuration information. This needs to be done to achieve any form of Engine Board interchangeability. The Host EEPROM is located on the Host Module and tells the Engine Board what device it is plugged into and what modules are installed. We need this to be defined and possibly include the MAC addresses (for example). The identified sentence states that the BSP describes the content and organization but it currently does not. Need to define how this memory will be used – 128 bytes. Need to look at NTCIP 1201. MAC address is a reasonable use – what is in it and who maintains the master list of what is acceptable. ACCEPTED
5.4.3	5-15	14-15	Currently, the BSP section does not define the "specific operational requirements for file transfers".	Either define the specific operational requirements within the BSP or reword these sentences. The requirements are still not adequately defined anywhere (in the BSP). Comments? Rejected Deferred to the BSP – words are unchanged.
5.4.5	5-17	6	Do we need to add a comment that the signal is supported as described in the BSP?	Add text to reference BSP support. Add the following text to the end of the last sentence "as described in the BSP". ACCEPTED
6.1.2	6-3	3-10	Now that we have an A1 connector and an A2 connector, the serial ports used by a comm module "switch"	Propose that if a serial port is subject to change dependent on the comm slot it is in, then the faceplate should identify it as "channel" instead of SPx. However, if a port does not change (e.g. uses pins on rows B

			depending on the slot they are installed in. We need to address this problem in the Serial Port Identification section.	and/or C of the 96 pin connector) then the identification shall remain as SPx. Also, see Resolution to comment New #12 for our previously discussed possible solution. This issue has been discussed and accepted at previous ATC WG meetings and needs to be addressed as presented in the resolution. Agreed to label the ports SPA, SPB, SPC rather than SPx – slots will be labeled – A1 & A2.
8.3	8-23 to 8-24	13 to 38	Technical problem: We are requiring that ENET1 be supported on the communication slot Ethernet pins, yet we have not assigned a "port" on Hub 1 for this purpose.	Needs to be corrected. Any ideas? We need to clarify this ... Agreed to add a 4th port to the hub 1 to run down the back-plane for future expansion. Lines are available but have not been used. (10Mb) – requires that this be tested for QPL.

6.4 The following table specifically addresses the NEMA Ballot comments and my concerns regarding how the resolutions have been implemented:

Comment #	Section	Page	Line #s	Issue	Recommendation
Ballot #4	--	--	--	Cannot find resolution point #6 in document	Add proposed "Authorized Engineering Information" Needs to be added per resolution. Authorized engineering information: to be added to 2.1 from Ballot 4 #6. ACCEPTED
Ballot #13	General	--	--	No mention of grounding (equipment ground) being per NEMA grounding method per TS 2	Add text that specifies that the ATC must adopt equipment grounding practices specified in NEMA TS 2. Text has been misplaced (currently in section 8.2.3). In its current location, the text is only applicable to TS 2 Type 1, whereas it needs to be applicable to ALL variations of the ATC controller. ACCEPTED Text to be moved to Section 10.1.4 titled Grounding. Change heading to include grounding.

Ballot #15	6.3.2.3	6-13	32-42	The dominant GDI 19,200 FSK modem is still not specified	<p>Include complete specifications for supporting the 19,200 bps FSK modem currently sold by GDI. The introductory text needs to be corrected to handle the addition of the 19,200 modem. For example, identify "0 to 19,200" at end of line 32; beginning of line 36 should start "Three...", etc.</p> <p>There were some markups from GDI on errors in the specification. And the cleanup of this section. Agreed. No changes to the 6A and 6B but will adopt the corrections recommended by CGD; research revealed that the current version does not match the CALTRANS 6A and 6B – they must be corrected. ACCEPTED</p>
Ballot #43	5.1.1	5-1	14-15	The resolution of the ballot comments requires that both "portable" and "compatible" be defined in the glossary and in Section 2 to give guidance to readers on the migration of applications to an ATC and the porting of applications between ATCs. Removing the text where these terms were used still does not convey this important message to the Users.	<p>Add terms to glossary and add text to section 2 discussing "portable" and "compatible" in terms of application programs.</p> <p>This resolution still has not been implemented. I feel that we need to include it to clarify the meaning of portable and compatible, and also to ensure that Users are aware of the implications.</p> <p>Agreed to define the process rather than define portability and compatibility – need to manage expectations. Ralph to provide a paragraph – in the section 4.3 – to be done.</p> <p>ACCEPTED</p>
Ballot #56	5.4.3	5-13	1-2	Resolution of Ballot #56 requires that 57.6k and 115.2k be identified as optional	<p>Change text appropriately ... SP8 was modified correctly.</p> <p>Change still not implemented as required. Identify the two baud rates as optional.</p> <p>ACCEPTED</p>
Ballot #57	5.4.3	5-13	17	Resolution of Ballot #57 requires that 57.6k and 115.2k be identified as optional (and not deleted)	<p>Change text appropriately ... SP8 was modified correctly.</p> <p>Change still not implemented as required. Add the two missing baud rates as optional.</p> <p>ACCEPTED</p>
Ballot #59	5.4.3	5-13	35	Resolution of Ballot #59 requires that 57.6k and 115.2k be identified as	<p>Change text appropriately ... SP8 was modified correctly.</p> <p>Change still not implemented as required.</p>

				optional (and not deleted)	Add the two missing baud rates as optional. ACCEPTED
Ballot #71	6.2.2	6-4 & 6-5	37-38 & 34-35	Point #2 of Ballot Resolution requires that +12VDC ISO and DCGND2 become reserved for future DCGND3 and +V for comm. This resolution was not challenged by the ATC WG, and so Point #3 is not needed.	Change A31, B31, C31, A32, B32, and C32 to "RESERVED" These changes have not been made per the resolution ... we need to discuss them. Also, now impacts pin out of "optional Second Communications Slot" on following page. Rejected – leave as is – like 2070.
Ballot #74	6.3.1.3	6-9	28-29	DCGND2 was removed by Resolution to Ballot #71, therefore these lines need to be deleted.	After implementing Resolution to Ballot #71, delete these two lines. These changes have not been made per the resolution ... we need to discuss them. Rejected
Ballot #75	6.3.1.4	6-9	32-34	DCGND2 and +12VDC ISO were removed by Resolution to Ballot #71, therefore the first sentence needs to be deleted.	After implementing Resolution to Ballot #71, delete the first sentence. These changes have not been made per the resolution ... we need to discuss them. Rejected
Ballot #76	6.3.1.5	6-10	1-4	A definition of "hot-swappable" in terms of maximum inrush is missing (per the Resolution). Section 7.2.6 specifies maximum and minimum constant current levels, but we have not addressed in-rush anywhere and should	For guidance, a TS 2 power supply can withstand a 10ms surge on the +12V and +24V supplies at 5 times their rating (i.e. 10A surge on their 2A spec). Meanwhile, the ATC2070 appears to be silent on this matter ... Is 5x an acceptable number or should we reduce to 3x or 4x until we get data? Also, we should limit the requirement to only supporting the hot-swap in-rush of one communication module at a time. We have added a statement about hot-swap but we have failed to provide criteria that are testable. This needs to be addressed. This needs to be quantified and defined – based on transient response of power supply; want transient to be relatively low for the modem – to minimize the cost of the

					base unit design to manage the inrush. – Suggested 3x for 10 ms on all supplies. ACCEPTED
Ballot #92	8.2.1.11	8-17 to 8-18	22 To 4	Text stills implies that the WDT will be adjusted to the value sent by the application, whereas the resolution is that it will be ignored.	Change text to state that the command will be received and responded to, but that the Timeout value in the Command frame will be ignored and the manufacturer selected timeout value will be maintained. Text needs to be reworded to clarify intent per the wording of the Resolution. Preference is to remove the command/response completely since there has never been an approved ATC Controller standard before. ACCEPTED
Ballot #94	8.4.3	8-26	9 & Fig 8-4	Oops ... SP7 should have changed to SP8 AND we should have added SP4. (Note SP7 was originally SP8 but later changed so that all port numbers would be consistent. It was later changed to back to SP8 due to User requests).	Correct text and drawing to show isolation of all serial ports including both SP4 and SP8 for communications. Drawing needs the Serial port in the lower right hand corner to be labeled as "SP8" ACCEPTED
New #12	6.2.2	6-4	25-27	To facilitate identification of serial ports on communication module faceplates, we discussed changing B23 to card installed, and making B22 an A1 slot identifier.	Add suggested signals to the Communication Slot pin assignment table(s). This issue is the same as in 6.1.2 identified above. The ATC WG has previously made this a requirement; yet, we have an issue with them also wanting to reuse existing 2070-x comm modules. ACCEPTED

6.5 Other Items:

- Section 6.3.1.1, Page 6-110: The termination resistors do not agree with both the 2070 values (and hence the module modules) and the ITS Cabinet (note Scott has modified them in his latest release). We need consistency across all standards. **Both the ATC and the 2070 will adjust the pull-up and pull-down and termination resistors for the internal communications lines and fully specify the values. Need to also adjust the 485 resistors per NEMA.**
ACCEPTED

- Section 7.1.4.1, Pages 7-27 to 7-28: Remove "(Note 2)" in four locations within table (configuration command codes). Per Jim Rose. **ACCEPTED**
- Section 10.1.5.5, Page 10-2, lines 29-31: The referenced "Environmental" section does not address any storage specifications. Suggest that the end of the last sentence be changed to " ... stored according to the component manufacturer's environmental requirements". **ACCEPTED**

7 Ralph issues

The aux switch does not appear to be properly specified. An aux switch should be mandated on the front panel.

The switch was inadvertently omitted although it is in the protocol to the front panel.

Resolution: The minimum front panel will not include an aux switch. Anything above the minimum requires the switch. 7.1.2.1 – option 1 to require the switch.

Escape sequences will be sent – they will not be stripped off by the API.

8 BSP Discussion

Jim Rose had commented that Pages 2-5, 2-6, and 2-7 (under subsection "3") should be removed yet they are still present. What are we doing here? I have numerous comments but if since they are being deleted I have not sent them in. **Resolution: Keep top table; keep only microlibc and busybox.**

2.2.5 – need to define misc. for table

- Note that the API is intended to provide portability for multiple applications on the ATC by providing device/resource sharing standards. The BSP will provide the initial measure of portability.
- Section 2.2.5, Page 2-5: HDLC is a Network protocol, yet the (top) table does not identify spXs as Network. **Not a network**
- Section 2.2.5, Page 2-5: Power Up / Down should be changed to "Powerdown" only - **Accepted**
- Section 2.2.5, Page 2-5: There is no reference to Linesync (correct) yet Appendix B describes it (wrong) **reference to linesync and PIO removed. Accepted**
- Section 2.2.5, Page 2-5: Datakey Present should be added as "character" and "interrupt" **and added to appendix B. Accepted**
- Section 2.2.5, Page 2-7: I am concerned that Users will not accept SP4 strictly as an operating system console. – this is not considered a problem. **Rejected there will be no additional ports added.**
- Appendix B needs to describe the SDLC requirements/interface ... it is not standard Linux. **Accepted**
- Appendix B (last page) ... no need to specify JFFS2 as this is implantation specific (depends on hardware only). **Accepted**
- Linux version information/requirements must move to appendix A. **Accepted**

9 Further Discussion of BSP

SPI specification on 5.4.3 – the section describes a 25010 chip. Need to specify functionally what is required and the format. Some data to be reserved and some to be fully specified. Need to determine format and keeper of the assignments. **Accepted - this is to be updated and an initial proposal is to be circulated for review by the ATC working group.**

10 Appendix A – Minimum Linux Kernel Configuration

Note that line numbers reference a different version [than the one provided by James Cheeks] that Peter generated with these line numbers. This file was distributed during the meeting.

Section	Page	Line #s	Issue	Recommendation
Appendix A	1	3-5	Kernel configuration options provided are for 2.4.xx, not 2.6.xx.	Add wording to indicate that these options are provided to illustrate the desired configuration selections. Actual configuration options may vary. USTC to update to 2.6.xx Accepted
Appendix A	1	12	Auto loading of kernel modules not enabled.	Add the following options: CONFIG_MODULE_UNLOAD CONFIG_OBSOLETE_MODPARM CONFIG_KMOD <i>This will enable the auto loading of the kernel modules. Accepted</i>
Appendix A	1	28	Boot line for the kernel may need to be configured as part of the kernel.	Delete this line No Change – add clarification. Rejected
Appendix A	1	31	Hotplug support should be added for USB functionality.	Add the following options: CONFIG_HOTPLUG CONFIG_KOBJECT_UEVENT Accepted
Appendix A	1	31	Add special kernel configuration options for embedded and/or real-time systems	Add the following options: CONFIG_EMBEDDED CONFIG_PREEMPT Accepted
Appendix A	1	35	The actual RTC option is processor specific. Additional RTC functionality is required to provide ATC functionality.	Move the RTC specification to Appendix B. This is not a “generic” kernel configuration option. Accepted
Appendix A	1	37	Requirement for MTD support is a function of the hardware implementation.	Delete these lines These are platform specific. Also delete JFFS2 requirements in Appendix B). Accepted

Appendix A	2	7,8	Duplicate options	Remove line 8, not applicable to Linux 2.6 configuration. Accepted
Appendix A	2	11	Advanced routing is not required.	Delete this line. This can be loaded by the application if needed. Accepted
Appendix A	2	13	Missing networking options.	Add the following options: CONFIG_IP_PNP_DHCP CONFIG_IP_PNP_BOOTP CONFIG_IP_MULTICAST CONFIG_SYN_COOKIES Accepted
Appendix A	2	14-23	Networking options not required for normal operation. These features may be added as modules if required.	Delete these lines. Accepted
Appendix A	2	25-34	No IDE peripherals are specified by the standard.	Delete these lines. If needed, this would be vendor specific. Accepted
Appendix A	2	36-38	Duplicated from lines 1,53-54 and 2,1	Delete these lines. Accepted
Appendix A	2	40-49	Duplicated from lines 6-12	Delete these lines. Accepted
Appendix A	2	54	No need to have network block device kernel support. A preferred method would be NFS via user applications.	Delete line. Accepted
Appendix A	3	5-12	PPP support can be included as a module if required.	Delete these lines. Rejected unless it can be dynamically loaded by the application.
Appendix A	3	20	Additional PTYS support is required in Linux 2.6	Add the following options: CONFIG_LEGACY_PTYS CONFIG_DEVPTS (possibly) Accepted
Appendix A	3	21	Requirement for I2C support is hardware implementation dependent.	Delete these lines. Accepted
Appendix	3	33,34	Since Win95, the file system type has been	Add:

A			VFAT. This will be the type of file-system found on USB storage devices.	CONFIG_VFAT_FS CONFIG_FAT_DEFAULT_CODEPAGE = iso8859-1 Accepted
Appendix A	3	35, 36, 40, 41	These file-system types are hardware / software implementation dependent.	Delete these lines. Accepted
Appendix A	3	42	Legacy file-system support may be required.	Add: CONFIG_DNOTIFY Accepted
Appendix A	3	56	Support for multiple partition types is only required for hard drives with multiple partitions and file-system types	Delete this line, And delete MSDOS NLS – but make sure this is not necessary for USB support. Accepted
Appendix A	4	20	USB storage support requires SCSI disk support.	Add the following options: CONFIG_SCSI CONFIG_SCSI_PROC_FS CONFIG_BLK_DEV_SD Accepted
Appendix A	4	25	CRC32 is a standard library.	Add the following options: CONFIG_CRC32 Accepted
Appendix A	4	25	Support for the Crypto API should be added to the kernel. What crypto modules used, if any, will be implementation specific.	Add the following options: CONFIG_CRYPTO allows the future addition of crypto modules – without this flag they cannot be added. Accepted

Note that the options will be deleted – which allows the option to be included later or as an option by a vendor. The BSP will not specify a NOT TO BE LOADED as that would preclude using the feature. Note that the 4.5 second load time is still in place.

11 Other Issues for the BSP

11.1 Serial Port Flow Control

George Chen (LADOT) asked how the BSP handles serial port flow control – TEES has this as part of the driver; **Vendor resolution:** if it is required, it should be done by the application. There was some discussion as to whether it should be in the API. In general the need is to be able to manipulate and monitor the I/O pins for the serial interfaces and to be able to manage

timing relationships between them. We don't know what Linux will do or what should be pushed to the API or the application. There was no resolution; **ACTION:** Peter to research what Linux will provide and what might be provided by available drivers. If there are drivers available, they will be specified; if not, this will be pushed to the application or custom driver not part of the BSP.

12 Clock and timing Clarification

Bob Rausch asked that the ATC and the ATC-2070 standards address the issue of RTC accuracy during power transients and when AC power is available. While it was agreed that this issue is important – it was asked that a sample paragraph of the requirements be circulated by June 21..

13 Appendix B – Comments

USTC hired a Linux technical expert to assist them in the review of the proposed BSP. Their consultant proposed to restructure Appendix B. The working group requested that Peter and Dave review the comments and modify the existing version to incorporate the proposed changes rather than re-structure the document.

13.1 Ray Deer's comments

Ray Deer (Peek Traffic) submitted some comments on the BSP which are shown below. In general, these had already been covered by the tables above. Each issue is covered separately.

13.1.1 Appendix B, Page 1, line 17. Currently, it calls out for the following to have directories for the port pins:

/dev/powerup

/dev/linesync

/dev/cpuactive

/dev/cpureset

Comment 1- We should do powerdown instead of powerup. Powerdown is a required event. Powerup is not required. Reseting the processor can be done with hardware.

Both were discussed and accepted above.

Comment 2- The Datakey Present input is not included. I think it was there in earlier discussions/documents.

This was discussed and agreed above.

Comment 3- Concerning the linesyn pin. Section 5.4.2 of the standard defines this as a "periodic interrupt" handled by the O/S. No PIO interface is required.

This was discussed and agreed above.

13.1.2 Appendix B, Page 7, line 22 eeprom....

/dev/spi

/dev/eeprom

Comment 4- Section 5.4.3 (page 5-14, line 18) says, concerning "contents and organization of the information is described in the BSP", but page 7, line 22 does not show any additional definition for the eeprom.

This was discussed and agreed. Need to add back the /dev/reserved and /dev/manufacturer to port node table.

13.1.3 Appendix B, Page 12, Line 6- USB...

Comment 5- Appendix B calls for standard linux drivers for USB. Do we want to do memory only or all USB devices? We should specify. Also, 5.4.3., Page 5-15, Line 14, says that specific operational requirements for file transfers via the USB port shall be described by the BSP, but Appendix B does not address it.

Either remove the comment or add the detail. **USB is for memory only.** It was suggested that clarification be added for the file system in general and include USB; USTC to expand file input from their consultant for inclusion into Appendix B.

13.1.4 Appendix B- Synchronous ports

Comment 6- Appendix B needs further definition to the synchronous serial ports. Section 2.2.5, Page 2-5 indicates them as "Misc." under character. There is no Linux standard for SDLC that we can adopt. HDLC is a network based handler. If we derived a SDLC driver from HDLC, it would also be network based. Do we want this?

This was discussed and agreed. It will be done – see above.

13.1.5 ATC, Section 2.2.5(3)-

Comment 7- (from Peter Ragsdale)- Based on previous Jim Rose comments indicating that 2.2.5(3) was going to be removed, so we made no comments on it. But, it is still there. Is it still going to be taken out? If not, we will comment on it, but can't get that in until tomorrow. Let us know if it is indeed going to be removed.

This was discussed and agreed. See above

14 Closing

The meeting adjourned at approximately 12:10 PM;

No additional meetings have been scheduled.