PERCOM DATA CO.

TECHNICAL MEMO

TM-CIS-3Ø-Ø2
CIS-3Ø+ CASSETTE INTERFACE

JULY 7, 1977

SUBJECT: USING THE PERCOM CIS-3Ø WITH SWTP 8K BASIC VERSION 2.Ø

TO ELIMINATE THE NEED FOR A CURSOR CONTROL CARD OR OTHER CONTROL CODE DECODER, THE PERCOM CIS-3Ø USES THE READER CONTROL (RC) OUTPUT FROM THE MP-C OR MP-S INTERFACE CARDS TO SWITCH BETWEEN DATA TERMINAL AND CASSETTE DATA INPUT TO THE COMPUTER. WHEN THE READER CONTROL LINE IS ON, THE CASSETTE PLAYER IS SELECTED. THE RELAY (IF INSTALLED) USED TO CONTROL THE CASSETTE PLAYER IS ALSO TURNED ON.

UNFORTUNATELY, THE LOAD INSTRUCTION IN SWTP 8K BASIC DOES NOT CONTROL THE READER CONTROL LINE.

TO PROVIDE AUTOMATIC SWITCHING OF THE CIS-3Ø WHEN USING THE LOAD COMMAND, MAKE THE FOLLOWING PROGRAM CHANGES TO SWTP 8K BASIC VERSION 2.Ø

LOCATION	OLD	NEW	COMMENT
Ø14E	1E	1E	REPOSITION START OF USER PROGRAM ALLOCATION
Ø14F	AF	C1	
ØBBF	BD	BD	CALL TO READER CONTROL TURN ON PATCH
ØBCØ	Ø3	1E	
ØBC1	86	B8	
ØD15	BD	BD	CALL TO READER CONTROL TURN OFF PATCH
ØD16	Ø3	1E	
ØD17	86	AF	
1EAF	X	BD	READER CONTROL TURN ON PATCH
1EBØ	X	Ø3	
1EB1	X	86	
1EB2	X	86	
1EB3	X	~~2C~~ 3C	
1EB4	X	B7	
1EB5	X	8Ø	
1EB6	X	Ø7	
1EB7	X	39	
1EB8	X	BD	READER CONTROL TURN OFF PATCH
1EB9	X	Ø3	
1EBA	X	86	
1EBB	X	86	
1EBC	X	34	
1EBD	X	B7	
1EBE	X	8Ø	
1EBF	X	Ø7	
1ECØ	X	39	

OTHER THAN THE ADDITION OF THE READER CONTROL FUNCTION, THE CHANGE DOES NOT ALTER THE OPERATION OF 8K BASIC IN ANY WAY.

THE STARTING POINT OF THE USER PROGRAM ALLOCATION WAS CHANGED TO PROVIDE A LOCATION FOR THE PATCH. THIS SHOULD NOT BE A PROBLEM UNLESS THE USER PROGRAM PREVIOUSLY USED ALL OF THE AVAILABLE MEMORY.

AFTER ADDING THE PATCH, YOU WILL WANT TO MAKE A COPY OF THE MODIFIED 8K BASIC. DUMP MEMORY FROM Ø1ØØ THROUGH 1ECØ .

ONE FINAL COMMENT: THE BASIC SAVE AND LOAD COMMANDS WILL NOT PERFORM PROPERLY AT 12ØØ BAUD WHEN USING THE MIKBUG® I/O ROUTINES TO WHICH 8K BASIC IS NORMALLY LINKED. THIS IS CAUSED BY A DESIGN FLAW IN MIKBUG®. THIS MAY BE CORRECTED BY LINKING THE INPUT/OUTPUT TO I/O ROUTINES DESCRIBED IN THE CIS-3Ø INSTRUCTION MANUAL APPENDIX E. A DESCRIPTION OF THE FLAWS IN MIKBUG® AND MEANS TO CIRCUMVENT THE CONSEQUENT PROBLEMS IS CONTAINED IN PERCOM TECHNICAL MEMO TM-CIS-3Ø-Ø3.

TO REDUCE THE TIME NECESSARY TO LOAD 8K BASIC, THE CASSETTE SUPPLIED BY SWTPC IS FURNISHED IN A BINARY FORMAT INSTEAD OF THE REGULAR MIKBUG ASCII HEX FORMAT. AT THE BEGINNING OF THE TAPE IS A BINARY LOADER PROGRAM WHICH IS LOADED INTO THE COMPUTER USING MIKBUG. THE PROGRAM THEN EXECUTES ITSELF AND LOADS THE MAIN PROGRAM WHICH IS IN THE BINARY FORMAT.

WHEN LOADING 8K BASIC, TYPE "L" TO START THE LOAD THEN FLIP THE TAPE SWITCH TO THE "ON" POSITION TO LOCK THE CIS-3Ø IN THE CASSETTE INPUT MODE. WHEN THE LOAD IS COMPLETED, FLIP THE TAPE SWITCH BACK TO "AUTO" AND RESET THE COMPUTER. READ THE NOTICE ENCLOSED IN THE SWTPC 8K BASIC USERS GUIDE FOR ADDITIONAL DETAIL.

PERCOM DATA CO.

TECHNICAL MEMO

TM-CIS-3Ø-Ø2
CIS-3Ø+ CASSETTE INTERFACE
JULY 7, 1977
REVISED NOV. 1Ø, 1977

SUBJECT: USING THE PERCOM CIS-3Ø+ WITH SWTP 8K BASIC VERSION 2.Ø.

TO ELIMINATE THE NEED FOR A CURSOR CONTROL CARD OR OTHER CONTROL CODE DECODER, THE PERCOM CIS-3Ø+ USES THE READER CONTROL (RC) OUTPUT FROM THE MP-C OR MP-S INTERFACE CARDS TO SWITCH BETWEEN DATA TERMINAL AND CASSETTE DATA INPUT TO THE COMPUTER. WHEN THE READER CONTROL LINE IS ON, THE CASSETTE PLAYER IS SELECTED. THE RELAY (IF INSTALLED) USED TO CONTROL THE CASSETTE PLAYER IS ALSO TURNED ON.

UNFORTUNATELY, THE LOAD INSTRUCTION IN SWTP 8K BASIC DOES NOT CONTROL THE READER CONTROL LINE.

THIS PROBLEM IS EASILY REMEDIED BY MAKING SEVERAL MINOR CHANGES TO 8K BASIC.

ADDITIONALLY, THE BASIC SAVE AND LOAD COMMANDS WILL NOT PERFORM RELIABILY AT 12ØØ BAUD WHEN USING THE MIKBUG(TM) I/O ROUTINES TO WHICH 8K BASIC IS NORMALLY LINKED. THIS IS CAUSED BY A DESIGN FLAW IN MIKBUG(TM) WHICH DOES NOT CAREFULLY CONTROL THE INTERCHARACTER TIMING. THIS IS CORRECTED BY SUBSTITUTING A MORE CAREFULLY TIMED OUTPUT ROUTINE FOR THE ONE IN MIKBUG(TM).

THE FOLLOWING PATCHES TO SWTP 8K BASIC VERSION 2.Ø SOLVE BOTH OF THE AFORE MENTIONED PROBLEMS.

LOCATION	OLD	NEW	COMMENT
014E	1E	1E	REPOSITION START OF USER PROGRAM
014F	AF	D0	
0BBF	BD	BD	CALL TO READER CONTROL TURN OFF
0BC0	03	1E	
0BC1	86	B8	
0D15	BD	BD	CALL TO READER CONTROL TURN ON
0D16	03	1E	
0D17	86	AF	
1EAF	X	BD	READER CONTROL TURN ON PATCH
1EB0	X	03	
1EB1	X	86	
1EB2	X	86	
1EB3	X	3C	
1EB4	X	B7	
1EB5	X	80	
1EB6	X	07	
1EB7	X	39	

LOCATION	OLD	NEW	COMMENT
1EB8	X	BD	READER CONTROL TURN OFF PATCH
1EB9	X	03	
1EBA	X	86	
1EBB	X	86	
1EBC	X	34	
1EBD	X	B7	
1EBE	X	80	
1EBF	X	07	
1EC0	X	39	
010F	7E	7E	MODIFY JUMP TO OUTPUT ROUTINE
0110	E1	1E	
0111	D1	C1	
1EC1	X	37	IMPROVED OUTPUT ROUTINE
1EC2	X	BD	(USE DATA IN PARENTHESIS FOR SWTBUG)
1EC3	X	E1	
1EC4	X	A5	(D3)
1EC5	X	C6	
1EC6	X	09	
1EC7	X	BD	
1EC8	X	E1	(E2)
1EC9	X	EF	(5A)
1ECA	X	6A	
1ECB	X	00	
1ECC	X	7E	
1ECD	X	E1	(E2)
1ECE	X	DA	(48)

OTHER THAN THE ADDITION OF THE READER CONTROL FUNCTION AND THE IMPROVED OUTPUT ROUTINE, THE CHANGES DO NOT ALTER THE OPERATION OF 8K BASIC IN ANY WAY.

THE STARTING POINT OF THE USER PROGRAM ALLOCATION WAS CHANGED TO PROVIDE A LOCATION FOR THE PATCH. THIS SHOULD NOT BE A PROBLEM UNLESS THE USER PROGRAM PREVIOUSLY USED ALL OF THE AVAILABLE MEMORY.

AFTER ADDING THE PATCH, YOU WILL WANT TO MAKE A COPY OF THE MODIFIED 8K BASIC. DUMP MEMORY FROM Ø1ØØ-1ECF.

TO REDUCE THE TIME NECESSARY TO LOAD 8 K BASIC, THE CASSETTE SUPPLIED BY SWTPC IS FURNISHED IN A BINARY FORMAT INSTEAD OF THE REGULAR MIKBUG(TM) ASCII-HEX FORMAT. AT THE BEGINNING OF THE TAPE IS A BINARY LOADER PROGRAM WHICH IS LOADED INTO THE COMPUTER USING MIKBUG(TM). THE PROGRAM THEN EXECUTES ITSELF AND LOADS THE MAIN PROGRAM WHICH IS IN BINARY.

WHEN LOADING 8K BASIC, TYPE "L" TO START THE LOAD THEN FLIP THE TAPE SWITCH TO THE "ON" POSITION TO LOCK THE CIS-3Ø+ INTO THE CASSETTE INPUT MODE. WHEN THE LOAD IS COMPLETED, FLIP THE TAPE SWITCH BACK TO "AUTO" AND RESET THE COMPUTER. READ THE NOTICE ENCLOSED IN THE SWTPC 8K BASIC USER GUIDE FOR ADDITIONAL DETAIL.

TO FURTHER REDUCE THE TIME TO LOAD BASIC WE SUGGEST YOU MAKE A CASSETTE COPY OF THE BASIC AT 12ØØ BAUD. FOLLOW THE INSTRUCTIONS ON PAGE 29 OF THE CIS-3Ø INSTRUCTION MANUAL. THIS PERMITS THE 8K BASIC INTERPRETER PROGRAM TO BE LOADED IN UNDER TWO MINUTES!

MIKBUG IS A TRADEMARK OF MOTOROLA INC.

PERCOM DATA CO.

TECHNICAL MEMO

TM-CIS-30-02
CASSETTE DATA SYSTEMS
REVISED 2-27-78

SUBJECT: USING THE PERCOM CIS-30+ WITH SWTP 8K BASIC VERSION 2.0

NOTICE: THE FOLLOWING INFORMATION APPLIES TO SYSTEMS USING EITHER MIKBUG(TM) OR SWTBUG(TM) IN CONJUNCTION WITH AN MP-C CONSOLE INTERFACE. REFER TO THE SUPPLEMENTAL SECTION AT THE END OF THIS MEMO FOR INFORMATION ON ADAPTING SWTP 8K BASIC TO SYSTEMS WHICH USE THE MP-S (ACIA) INTERFACE FOR CONSOLE I/O.

TO ELIMINATE THE NEED FOR A CURSOR CONTROL CARD OR OTHER CONTROL CODE DECODER, THE PERCOM CIS-30+ USES THE READER CONTROL (RC) OUTPUT FROM THE MP-C OR MP-S INTERFACE CARDS TO SWITCH BETWEEN DATA TERMINAL AND CASSETTE DATA INPUT TO THE COMPUTER. WHEN THE READER CONTROL LINE IS ON, THE CASSETTE PLAYER IS SELECTED. THE RELAY (IF INSTALLED) USED TO CONTROL THE CASSETTE PLAYER IS ALSO TURNED ON.

UNFORTUNATELY, THE LOAD INSTRUCTION IN SWTP 8K BASIC DOES NOT CONTROL THE READER CONTROL LINE. THIS PROBLEM IS EASILY REMEDIED BY MAKING SEVERAL MINOR CHANGES TO 8K BASIC.

THE 8K BASIC SAVE AND LOAD COMMANDS WILL NOT PERFORM RELIABLY AT 1200 BAUD WHEN USING AN MP-C (BIT BANGER PIA) INTERFACE FOR THE DATA TERMINAL I/O. THE 'BIT BANGER' OUTPUT ROUTINES IN BOTH MIKBUG(TM) AND SWTBUG(TM) TO WHICH 8K BASIC IS NORMALLY LINKED DO NOT MAINTAIN STRICT TIMING BETWEEN THE END OF ONE CHARACTER AND THE BEGINNING OF THE NEXT CHARACTER WHEN OUTPUTTING THROUGH THE MP-C INTERFACE. THIS IS CORRECTED BY SUBSTITUTING A MORE CAREFULLY TIMED 'BIT BANGER' OUTPUT ROUTINE FOR THE ONE IN MIKBUG(TM) AND SWTBUG(TM). ---THIS PROBLEM DOES NOT NORMALLY OCCUR WHEN USING AN MP-S (ACIA) INTERFACE---. HOWEVER VERSION 2.0 OF SWTP 8K BASIC WAS NOT DESIGNED TO FUNCTION WITH AN MP-S INTERFACE AS THE CONTROL OR CONSOLE PORT. SWTP 8K BASIC HAS SINCE BEEN REVISED (VERSION 2.2) TO ACCOMMODATE AN MP-S INTERFACE. OPERATION OF THE PERCOM CIS-30 WITH SWTP BASIC VERSION 2.2 IS DESCRIBED IN THE SUPPLEMENTAL SECTION AT THE END OF THIS TECHNICAL MEMO.

THE FOLLOWING PATCHES TO SWTP 8K BASIC VERSION 2.0 SOLVE BOTH OF THE AFOREMENTIONED PROBLEMS.

ADDRESS	OLD	NEW	COMMENT
014E	1E	1E	REPOSITION START OF USER PROGRAM SPACE
014F	AF	D0	
0BBF	BD	BD	CALL TO READER CONTROL TURN OFF PATCH
0BC0	03	1E	
0BC1	86	B8	
0D15	BD	BD	CALL TO READER CONTROL TURN ON PATCH
0D16	03	1E	
0D17	86	AF	

ADDRESS	OLD	NEW	COMMENT
1EAF	X	BD	READER CONTROL TURN ON PATCH
1EB0	X	03	
1EB1	X	86	
1EB2	X	86	
1EB3	X	3C	
1EB4	X	B7	
1EB5	X	80	
1EB6	X	07	
1EB7	X	39	
1EB8	X	BD	READER CONTROL TURN OFF PATCH
1EB9	X	03	
1EBA	X	86	
1EBB	X	86	
1EBC	X	34	
1EBD	X	B7	
1EBE	X	80	
1EBF	X	07	
1EC0	X	39	
010F	7E	7E	JUMP TO IMPROVED OUTPUT ROUTINE
0110	E1	1E	INSTEAD OF THE MP-C OUTPUT ROUTINE
0111	D1	C1	IN MIKBUG(TM) OR SWTBUG(TM)
1EC1	X	37	IMPROVED MP-C OUTPUT ROUTINE
1EC2	X	BD	(USE DATA IN PARENTHESIS FOR SWTBUG)
1EC3	X	E1	
1EC4	X	A5	(D3)
1EC5	X	C6	
1EC6	X	09	
1EC7	X	BD	
1EC8	X	E1	(E2)
1EC9	X	EF	(5A)
1ECA	X	6A	
1ECB	X	00	
1ECC	X	7E	
1ECD	X	E1	(E2)
1ECE	X	DA	(48)

OTHER THAN THE ADDITION OF THE READER CONTROL FUNCTION AND THE IMPROVED MP-C OUTPUT ROUTINE, THE CHANGES DO NOT ALTER THE OPERATION OF 8K BASIC IN ANY WAY. AFTER ADDING THE PATCH, YOU WILL WANT TO MAKE A COPY OF THE MODIFIED BASIC. DUMP MEMORY FROM $0100-$1ECF.

TO REDUCE THE TIME NECESSARY TO LOAD 8K BASIC, THE CASSETTE SUPPLIED BY SWTPC IS FURNISHED IN A BINARY FORMAT INSTEAD OF THE REGULAR MOTOROLA ASCII-HEX FORMAT. AT THE BEGINNING OF THE TAPE IS A BINARY LOADER PROGRAM WHICH IS LOADED INTO THE COMPUTER USING MIKBUG(TM) OR SWTBUG(TM). THE PROGRAM THEN EXECUTES ITSELF AND LOADS THE MAIN PROGRAM WHICH IS IN BINARY. WHEN LOADING SWTP 8K BASIC, TYPE `L` TO START THE LOAD THEN FLIP THE TAPE SWITCH TO THE `ON` POSITION TO LOCK THE CIS-30 INTO THE CASSETTE INPUT MODE. WHEN THE LOAD IS

COMPLETED, FLIP THE TAPE SWITCH BACK TO 'AUTO' AND RESET THE COMPUTER. READ THE NOTICE ENCLOSED IN THE SWTP 8K BASIC USER GUIDE FOR ADDITIONAL DETAIL.

TO FURTHER REDUCE THE TIME TO LOAD BASIC WE SUGGEST YOU MAKE A CASSETTE COPY OF THE BASIC AT 1200 BAUD. FOLLOW THE INSTRUCTIONS IN APPENDIX E OF THE CIS-30 INSTRUCTION MANUAL. THIS PERMITS THE SWTP 8K BASIC TO BE LOADED IN LESS THAN TWO MINUTES!

SUPPLEMENTAL 2-28-78

SUBJECT: USING THE PERCOM CIS-30 CASSETTE INTERFACE WITH SWTP 8K BASIC VERSION -2.2- AND THE SWTP MP-S INTERFACE.

SWTP 8K BASIC VERSION 2.2 IS A MODIFICATION OF VERSION 2.0 WHICH PERMITS EITHER AN MP-C OR AND MP-S (ACIA) INTERFACE TO BE USED AS THE CONSOLE I/O PORT (PORT #1). THE DIFFERENCES BETWEEN VERSION 2.0 AND 2.2 ARE MINOR. VERSION 2.2 INCLUDES A PATCH TO DETERMINE WHETHER AN MP-C OR AN MP-S INTERFACE IS THE CONSOLE I/O PORT AND WHETHER THE RESIDENT ROM OPERATING SYSTEM IS MIKBUG(TM) OR SWTBUG(TM). A SECOND PATCH MODIFIES THE BREAK TEST ROUTINE TO FUNCTION WITH EITHER THE MP-C OR MP-S INTERFACES.

NEITHER VERSION CONTROLS THE READER CONTROL LINE. SINCE THE SOFTWARE NEEDED TO CONTROL THE READER CONTROL OUTPUT ON THE MP-S INTERFACE IS DIFFERENT FROM THAT REQUIRED TO CONTROL THE MP-C INTERFACE, WE SUGGEST THE FOLLOWING PROCEDURES:

-- IF YOU ARE USING AN MP-C (BIT BANGER PIA) INTERFACE AS THE CONSOLE I/O PORT, MODIFY SWTP 8K BASIC VERSION 2.2 SO THAT IT IS THE SAME AS VERSION 2.0. THEN FOLLOW THE DIRECTIONS SUPPLIED EARLIER IN THIS MEMO. THE IMPORTANT DIFFERENCES BETWEEN VERSION 2.0 AND 2.2 ARE AS FOLLOWS:

ADDRESS	2.0	2.2	FUNCTION IN VERSION 2.2
014E	1E	1E	START OF USER PROGRAM SPACE
014F	AF	E2	
03A3	B6	7E	JUMP TO BREAK TEST PATCH
03A4	80	1E	
03A5	04	CB	
0B91	7F	BD	CALL TO INITIALIZATION PATCH
0B92	00	1E	
0B93	91	B0	

-- IF YOU ARE USING AN MP-S (ACIA) INTERFACE AS THE CONSOLE I/O PORT, THE FOLLOWING PATCHES WILL IMPLEMENT PROPER CONTROL OF THE READER CONTROL LINE ON THE MP-S INTERFACE.

ADDRESS	OLD	NEW	COMMENT
014E	1E	1E	REPOSITION START OF USER PROGRAM SPACE
014F	E2	F4	
0BBF	BD	BD	CALL TO READER CONTROL TURN OFF PATCH
0BC0	03	1E	
0BC1	86	EB	
0D15	BD	BD	CALL TO READER CONTROL TURN ON PATCH
0D16	03	1E	
0D17	86	E2	
1EE2	X	BD	READER CONTROL TURN ON PATCH (MP-S)
1EE3	X	03	
1EE4	X	86	
1EE5	X	86	
1EE6	X	55	
1EE7	X	B7	
1EE8	X	80	
1EE9	X	04	
1EEA	X	39	
1EEB	X	BD	READER CONTROL TURN OFF PATCH (MP-S)
1EEC	X	03	
1EED	X	86	
1EEE	X	86	
1EEF	X	11	
1EF0	X	B7	
1EF1	X	80	
1EF2	X	04	
1EF3	X	39	

REFER TO TECHNICAL MEMO TM-CIS-30-15 FOR MORE INFORMATION ABOUT USING THE PERCOM CIS-30 WITH ACIA TYPE INTERFACES.

THE INFORMATION IN THIS MEMO HAS BEEN THOROUGHLY CHECKED FOR ACCURACY. HOWEVER, PERCOM CAN NOT GUARANTEE COMPLETENESS NOR SUITABILITY FOR ANY PURPOSE.