C. Serial Control Formats

The RCP02 is controlled by a two-way, asynchronous RS-232 data line that is typically run at speed of 19.2K baud. A host computer controls the servo and the antenna while receiving feedback status. The information is then transferred in packets consisting of two or more bytes—each packet begins with a SYNC byte and ends with an END byte of FF(Hex). All SYNC bytes have the MSB set and the value indicates the type of packet to follow. The variety of packets currently available are 80(hex) for antenna, C0(hex) for BITE, and B0(hex) for time. The packet layouts are described in the following paragraph. Each packet-type has a specific direction of travel, such as to or from the RCP02, but packets can arrive in any order within the serial stream.

Several types of antenna communication formats are supported. Older systems use the RCV01 and XMT01 formats but the newer systems can use the RCV02 and the XMT02 formats. The RCV03 format is intended for systems on moving platforms, such as ships or airplanes. One of the challenges of these systems is to correct the radar's measured radial velocity for the motion of the platform. To make this correction, the three-dimensional velocity and orientation of the platform must be recorded. Typically, the information comes from an inertial navigation system. For shipboard system, an update rate of approximately 20 reports per second can satisfy the velocity correction requirements at 19200 baud.

The following angles, with the exception of the latitude and the longitude, are transmitted as 14-bit binary angles. The latitude and longitude are both 21-bit binary angles.

- azimuth and elevation
- train order
- pitch, roll, and heading

In the XMT01 format, the angular speed is a signed number in units of 0.55^{o}/sec. In all other formats, the angular rates are in signed 14-bit binary angles per second. Therefore, the largest possible value is 180^{o}/sec (30 rpm) and the step is 0.022^{o}/sec. All velocities are in signed cm/sec with the altitude in signed meters. If some of the information is not available at the full resolution of the data format, the low bits are filled with zeros.

The azimuth and the elevation angles are corrected angles relative to the north and are the angles that the antenna is pointed relative to the deck of the platform. These calculations are derivable from the other angles but are also reported to assist in the data analysis, especially if one of the sensors or the stabilization fails.

The pitch is the angle between the fore-and-aft axis of the platform and the horizontal is measured in the vertical plane. The pitch is positive when the bow is down and the roll is the rotation angle about the fore-and-aft axis in its pitched position. The pitch is measured in the plane perpendicular to the fore-and-aft axis, which is generally not the vertical plane, and the roll is positive when the deck is down on the port side.

Note: The pitch can be directly measured by a level on the fore-and-aft axis but the roll cannot be directly measured by a one-axis tilt meter.

The heading is referred to as the direction the platform is pointed but is not the same as direction of motion. The platform could be pointed one way and drifting backwards.

The time stamp is a 14-bit counter incremented by the RCP02 once per millisecond. The RCP02 should latch all the data for a packet at the same time. This counter allows the host computer to accurately judge the time between samples without the serial line latencies and fluctuations due to the time sharing operating system.

The position of the platform is reported by the latitude, the longitude, and the altitude. Since the altitude may not be implemented for systems on ships, the setting will be zero.

Table C–1: Status Packet RCV01 Format (RCP02 to Host)

Char	Function
1	SYNC Byte (80 Hex)
2	Azimuth Low 7 bits
3	Azimuth High 7 bits
4	Elevation Low 7 bits
5	Elevation High 7 bits
6	Status #1 D6 = Low air flow D5 = Low Waveguide pressure D4 = Servo power D3 = Antenna Local mode D2 = Interlock D1 = Standby D0 = Radiate On
7	Status #2 D6 = RCP02 is shutdown D5 = LSB pulse width D4 = T/R power On D3 = T/R Local mode D2 = Spare D1 = MSB pulse width D0 = Magnetron current normal
8	End Of Message (FF Hex)

Table C–2: Control Packet XMT01 Format (Host to RCP02)

Char	Function
1	SYNC Byte (80 Hex)
2	Azimuth Low 7 bits
3	Azimuth High 7 bits
4	Elevation Low 7 bits
5	Elevation High 7 bits
6	Control Word #1 D6 = MSB of Pulse Width D5 = Leave Pulse Width unchanged D4 = Spare D3 = Signal Generator On D2 = Signal Generator CW D1 = EL (1 = Scan, 0 = Position) D0 = AZ (1 = Scan, 0 = Position)
7	Control Word #2 D6 = Reset RCP02 on edge D5 = Noise Source On D4 = LSB of Pulse width D3 = Radiate On complemented D2 = Radiate On D1 = Servo Power On D0 = T/R Power On
8	Control Word #3 (all spare)
9	Signal generator level (unsigned 0–127dB attenuation)
10	AZ/EL Antenna speed (signed 7 bit, 0.55 degree resolution)
11	END OF MESSAGE (FF Hex)

Table C–3: Status Packet RCV02 / RCV04 Format (RCP02 to Host)

Char	Function
1	SYNC Byte (80 Hex)
2	Azimuth Low 7 bits
3	Azimuth High 7 bits
4	Elevation Low 7 bits
5	Elevation High 7 bits
6	Azimuth Rate Low 7 bits
7	Azimuth Rate High 7 bits
8	Elevation Rate Low 7 bits
9	Elevation Rate High 7 bits
10	Status #1 D6 = Low air flow D5 = Low Waveguide pressure D4 = Servo Power D3 = Antenna Local mode D2 = Interlock Open D1 = Standby D0 = Radiate On
11	Status #2 D6 = RCP02 is shutdown D5 = LSB pulse width D4 = T/R Power On D3 = T/R Local mode D2 = Spare D1 = MSB pulse width D0 = Mag. current normal
12	Status #3 D6 = IRIS Mode 2 D5 = IRIS Mode 1 D4 = IRIS Mode 0 D3 = Spare D2 = Signal Generator fault D1 = Signal Generator On D0 = Signal Generator CW
13	Signal generator level (0=max power)
14	Time Stamp Low 7 bits
15	Time Stamp High 7 bits
16	END OF MESSAGE (FF Hex)

Table C–4: Control Packet XMT02 / XMT04 Format (Host to RCP02)

Char	Function
1	SYNC Byte (80 Hex)
2	Azimuth Low 7 bits
3	Azimuth High 7 bits
4	Elevation Low 7 bits
5	Elevation High 7 bits
6	Control Word #1 D6 = MSB of Pulse Width D5 = Leave Pulse Width unchanged D4 = Spare D3 = Signal Generator On D2 = Signal Generator CW D1 = EL (1 = Scan 0 = Position) D0 = AZ (1 = Scan 0 = Position)
7	Control Word #2 D6 = Reset RCP02 on rising edge D5 = Noise Source On D4 = LSB of Pulse width D3 = Radiate On complemented D2 = Radiate On D1 = Servo Power On D0 = T/R Power On
8	Control Word #3 D6 = IRIS Mode 2 D5 = IRIS Mode 1 D4 = IRIS Mode 0 D3 = Radar Workstation A okay D2 = Radar Workstation B okay D1 = Data Processor A okay D0 = Data Processor B okay
9	Signal Generator level (0–127 dB attenuation)
10	AZ Antenna Speed Low 7 bits
11	AZ Antenna Speed High 7 bits
12	EL Antenna Speed Low 7 bits
13	EL Antenna Speed High 7 bits
14	END OF MESSAGE (FF Hex)

Table C–5: Status Packet RCV03 Format (RCP02 to Host)

Char	Function
1	SYNC Byte (80 Hex)
2	Identification byte
3	Azimuth Low 7 bits (Earth relative)
4	Azimuth High 7 bits
5	Elevation Low 7 bits (Earth relative)
6	Elevation High 7 bits
7	Train Order Low 7 bits (azimuth of pedestal relative to the ship)
8	Train Order High 7 bits
9	Elevation Order Low 7 bits (elevation of pedestal relative to the ship)
10	Elevation Order High 7 bits
11	Pitch Low 7 bits
12	Pitch High 7 bits
13	Roll Low 7 bits
14	Roll High 7 bits
15	Heading Low 7 bits
16	Heading High 7 bits
17	Azimuth Rate Low 7 bits
18	Azimuth Rate High 7 bits
19	Elevation Rate Low 7 bits
20	Elevation Rate High 7 bits
21	Pitch Rate Low 7 bits (LSB = Zero)
22	Pitch Rate High 7 bits
23	Roll Rate Low 7 bits (LSB = Invalid Roll)
24	Roll Rate High 7 bits
25	Heading Rate Low 7 bits (LSB = Invalid Heading)
26	Heading Rate High 7 bits
27	Status #1 D6 = Low air flow D5 = Low Waveguide pressure D4 = Servo power D3 = Antenna Local mode D2 = Interlock open D1 = Standby D0 = Radiate ON

28 Status #2
- D6 = RCP02 is shutdown
- D5 = LSB pulse width
- D4 = T/R Power on
- D3 = T/R Local mode
- D2 = Spare
- D1 = MSB pulse width
- D0 = Mag. current normal

29 Status #3
- D6 = Reserved
- D5 = Spare
- D4 = Spare
- D3 = Spare
- D2 = Signal Generator fault
- D1 = Signal Generator On
- D0 = Signal Generator CW

30 Signal generator value (0=full signal)

31 Time Stamp Low 7 bits
32 Time Stamp High 7 bits

33 Latitude Low 7 bits
34 Latitude Middle 7 bits
35 Latitude High 7 bits

36 Longitude Low 7 bits
37 Longitude Middle 7 bits
38 Longitude High 7 bits

39 Altitude Low 7 bits
40 Altitude High 7 bits

41 Velocity East Low 7 bits (LSB = Invalid Lat/Lon)
42 Velocity East High 7 bits

43 Velocity North Low 7 bits (LSB = Zero)
44 Velocity North High 7 bits

45 Velocity Up Low 7 bits (LSB = Invalid Altitude)
46 Velocity Up High 7 bits

47 END OF MESSAGE (FF Hex)

Table C–6: Status Packet RCV05 Format (RCP02 to Host)

Char	Function
1–15	These bytes exactly match the RCV02 / RCV04 format
16	Dual-System Status D6 = RCP02 is configured as a Dual-System D5 = Dual-System Mode MSB D4 = Dual-System Mode LSB D3 = This packet was sent from Unit "A" D2 = Information is known about the "Other" unit D1 = Unit "A" is the preferred system D0 = Unit "B" is disabled Note: The 2-bit Dual-System Mode codes are: 00 : Unknown 01 : System "A" 10: System "B" 11 : Auto Switch
17	Dual-System Status D6 = Unit "B" is okay D5 = Unit "B" Activity Code MSB D4 = Unit "B" Activity Code LSB D3 = Unit "A" is disabled D2 = Unit "A" is okay D1 = Unit "A" Activity Code MSB D0 = Unit "A" Activity Code LSB Note: The 2-bit Dual-System Activity codes are: 00 : Inactive 01 : Warmup 10: Active Now 11 : Reserved
18	Dual-System Status D6 = RCP02 is configured for voluntary flipping D5 = Unit "B" is offering to give up control D4 = Unit "A" is offering to give up control D3 = Unit "B" would be used if it were available D2 = Unit "A" would be used if it were available
19	Polarization Status D2:0 = Current Polarization XMT control 0=Horizontal; 1=Vertical; 2=Alternating; 3=Simultaneous D3 = Polarization switch is OK to XMT
20	Spare
21	Spare
22	Spare
23	Spare
24	END OF MESSAGE (FF Hex)

Table C–7: Control Packet XMT05 Format (Host to RCP02)

Char	Function
1–13	These bytes exactly match the XMT02 / XMT04 format
14	Control Word #4 D6 = Dual-System: Mode MSB D5 = Dual-System: Mode LSB D4 = Dual-System: Offer to relinquish control D3 = Dual-System: Unit would be used if available D2 = Spare D1 = Spare D0 = Spare Note: The 2-bit Dual-System Mode codes are: 00 : No change 01 : System "A" 10: System "B" 11 : Auto Switch
15	Control Word #5 D2:0 = Requested Polarization XMT control 0=Horizontal; 1=Vertical; 2=Alternating; 3=Simultaneous 7=Unchanged D6:3 = Spare
16	Spare
17	Spare
18	END OF MESSAGE (FF Hex)

Table C–8: Time Packet (RCP02 to Host)

Char	Function
1	SYNC Byte (B0 Hex)
2	Year Low 7 bits
3	Year High 7 bits
4	Month
5	Day
6	Hour
7	Minute
8	Second
9	1/100 of second
10	Status (unused, zero)
11	END OF MESSAGE (FF Hex)

Table C–9: Generic BITE Packet (RCP02 to/from Host)

The BITE status packet consists of a packet from 3 to 20 bytes in length. The first two bytes, and the last byte, are used for identification purposes. The bytes in the middle must have their MSB zero, but can contain arbitrary status in the lower 7 bits. This is typically used to report test results in the individual bits, such as cabinet interlocks, airflow sensors, and power supply checks.

Char	Function
1	SYNC Byte (C0 Hex)
2	Identification byte (00 Hex)
3	Status byte #1
4	Status byte #2
.	
.	
.	
N–1	Status byte #N–3
N	END OF MESSAGE (FF Hex)

Table C–10: Internal BITE Packet (RCP02 to Host)

The RCP02 can optionally generate this "internal" BITE packet. These bits convey additional status information that is not contained in any of the other transmission formats. The shutdown status of the RCP02 (up to 32 different conditions) is contained in the first five bytes. The last five bytes hold other miscellaneous information. The identification byte is selectable, so that conflicts with other BITE packets can be avoided.

Char	Function
1	SYNC Byte (C0 Hex)
2	Identification byte (User Choice)

3 Shutdown Conditions 0–6
- D6 = EL Velocity Exceeded
- D5 = AZ Velocity Exceeded
- D4 = EL Axis Unresponsive
- D3 = AZ Axis Unresponsive
- D2 = EL Tach Inconsistent
- D1 = AZ Tach Inconsistent
- D0 = Diagnostics Failed

4 Shutdown Conditions 7–13
- D6 = IP-SERIAL Conflicts
- D5 = EL Upper Lim Switch
- D4 = EL Lower Lim Switch
- D3 = EL–UP Shutdown Limit
- D2 = EL–LO Shutdown Limit
- D1 = AZ–HI Shutdown Limit
- D0 = AZ–LO Shutdown Limit

5 Shutdown Conditions 14–20
- D6 = Reserved
- D5 = Reserved
- D4 = Reserved
- D3 = Reserved
- D2 = IP-DIGITAL-48 Conflicts
- D1 = Output Remap Conflict
- D0 = Missing IP-SYNCHRO

6 Shutdown Conditions 21–27
- D6 = Reserved
- D5 = Reserved
- D4 = Reserved
- D3 = Reserved
- D2 = Reserved
- D1 = Reserved
- D0 = Reserved

7 Shutdown Conditions 28–31
- D6 = Spare
- D5 = Spare
- D4 = RCP02 is shutdown (OR of Bits 0–31)
- D3 = User Shutdown #2
- D2 = User Shutdown #1
- D1 = Reserved
- D0 = Reserved

8 INU Status
- D6 = Invalid horizontal position/velocity
- D5 = Reduced vertical position/velocity

D4 = Invalid vertical position/velocity
D3 = Reduced roll and pitch
D2 = Invalid roll and pitch
D1 = Reduced heading
D0 = Invalid heading

9 Antenna/Radar/Servo and INU status
D6 = Reduced horizontal position/velocity
D5 = No INU Data Stream
D4 = T/R Power On
D3 = T/R Local mode
D2 = LSB pulse width
D1 = MSB pulse width
D0 = Mag. current normal

10 Antenna/Radar/Servo status
D6 = Low air flow
D5 = Low Waveguide pressure
D4 = Servo Power
D3 = Antenna Local mode
D2 = Interlock Open
D1 = Standby
D0 = Radiate On

11 Local Variables V6, V5, V4, V3, V2, V1, V0

12 Local Variables V13, V12, V11, V10, V9, V8, V7

13 END OF MESSAGE (FF Hex)

Table C–11: Auxiliary Status/Control BITE Packets

The RCP02 contains 64 auxiliary status and control variables, labeled S[0:63] and C[0:63]. These bits may be sent to and from the host computer in the form of 13-byte BITE packets holding the full set of 64 bits. The format of these packets is the same in both directions, and the identification byte is selectable so that conflicts with other BITE packets can be avoided. A subset of the auxiliary bits may optionally be assigned to electrical input and output lines that are driven by one or two additional IP-DIGITAL-48 modules. The low numbered variables are assigned to however many hardware lines are allocated.

Char	Function							
1	SYNC Byte (C0 Hex)							
2	Identification byte (User Choice)							
3	Control/Status Bits	6	5	4	3	2	1	0
4	Control/Status Bits	13	12	11	10	9	8	7
5	Control/Status Bits	20	19	18	17	16	15	14

6	Control/Status Bits	27 26 25 24 23 22 21
7	Control/Status Bits	34 33 32 31 30 29 28
8	Control/Status Bits	41 40 39 38 37 36 35
9	Control/Status Bits	48 47 46 45 44 43 42
10	Control/Status Bits	55 54 53 52 51 50 49
11	Control/Status Bits	62 61 60 59 58 57 56
12	Control/Status Bit	63
13	END OF MESSAGE (FF Hex)	

Table C–12: Internal A/D Converter Q-BITE (RCP02 to Host)

The RCP02 can optionally generate this Q-BITE packet which represents the eight A/D converter levels that are built into the board (See Section 2.1.8). These come through as 12-bit signed quantities (–2048 to +2047) corresponding to a –5V to +5V span.. The identification byte is selectable, so that conflicts with other Q-BITE packets can be avoided. The packet will be sent whenever there is a change in any of the data values, as long as there has been at least one second since the last transmission.

Char	Function
1	SYNC Byte (AF Hex)
2	Identification byte (User Choice)
3–4	A/D Converter Channel 0
5–6	A/D Converter Channel 1
7–8	A/D Converter Channel 2
9–10	A/D Converter Channel 3
11–12	A/D Converter Channel 4
13–14	A/D Converter Channel 5
15–16	A/D Converter Channel 6
17–18	A/D Converter Channel 7
19	END OF MESSAGE (FF Hex)

Table C–13: Andrew-Kintec BITE Packet (RCP02 to Host)

The RCP02 will generate this BITE packet whenever the Andrew-Kintec ACU pedestal interface has been enabled. The identification byte is selectable, so that conflicts with other BITE packets can be avoided. The "S" number appearing after each table entry is the numbered status variable that can optionally be driven by the respective bit. Most bits in the BITE packet are merely copies of their ACU counterparts. However, S29, S30, and S31 are supplied by the RCP02 itself.

Char	Function
1	SYNC Byte (C0 Hex)
2	Identification byte (User Choice)

3	Status and Fault Conditions	
	D6 = Pedestal system interlock safe	(S35)
	D5 = Elevation brake applied	(S34)
	D4 = Azimuth seeking (else achieved)	(S33)
	D3 = Elevation seeking (else achieved)	(S32)
	D2 = Spare	(S31)
	D1 = Spare	(S30)
	D0 = ACU serial reception is okay	(S29)
4	Status and Fault Conditions	
	D6 = EL PWM RAM fault	(S42)
	D5 = EL PWM MTR Resolver fault	(S41)
	D4 = EL PWM PWR Bridge fault	(S40)
	D3 = Reserved	(S39)
	D2 = Azimuth timeout error	(S38)
	D1 = Elevation timeout error	(S37)
	D0 = Command denied (else accepted)	(S36)
5	Status and Fault Conditions	
	D6 = Elevation drive fault	(S49)
	D5 = Elevation stow fault	(S48)
	D4 = AZ PWM Watchdog fault	(S47)
	D3 = AZ PWM RAM fault	(S46)
	D2 = AZ PWM MTR Resolver fault	(S45)
	D1 = AZ PWM PWR Bridge fault	(S44)
	D0 = EL PWM Watchdog fault	(S43)
6	Status and Fault Conditions	
	D6 = EL PWM bus voltage fault	(S56)
	D5 = Reserved	(S55)
	D4 = Azimuth drive fault	(S54)
	D3 = Azimuth temperature fault	(S53)
	D2 = Azimuth stow fault	(S52)
	D1 = Elevation temperature fault	(S51)
	D0 = Elevation limit fault	(S50)
7	Status and Fault Conditions	
	D6 = Oil level low	(S63)
	D5 = Pedestal interlock safe	(S62)
	D4 = Radiation interlock safe	(S61)
	D3 = Supply voltage fault	(S60)
	D2 = AZ R/D converter fault	(S59)
	D1 = EL R/D converter fault	(S58)
	D0 = AZ PWM bus voltage fault	(S57)
8	END OF MESSAGE (FF Hex)	

Table C–14: Orbit Pedestal BITE Packet (RCP02 to Host)

The RCP02 will generate this BITE packet whenever the Orbit pedestal interface has been enabled. The identification byte is selectable, so that conflicts with other BITE packets can be avoided. The "S" number appearing after each table entry is the numbered status variable that can optionally be driven by the respective bit. Most bits in the BITE packet are merely copies of their Orbit status word counterparts. However, S63 is supplied by the RCP02 itself.

Char	Function	
1	SYNC Byte (C0 Hex)	
2	Identification byte (User Choice)	
3	Status and Fault Conditions	
	D6 = AZ Software CCW Limit Active	(S46)
	D5 = AZ Software CW Limit Active	(S45)
	D4 = Azimuth Stuck	(S44)
	D3 = Azimuth Calibrated	(S43)
	D2 = Azimuth Zero Limit Switch Active	(S42)
	D1 = Azimuth CCW Limit Switch Active	(S41)
	D0 = Azimuth CW Limit Switch Active	(S40)
4	Status and Fault Conditions	
	D6 = Elevation Software CW Limit	(S53)
	D5 = Elevation Stuck	(S52)
	D4 = Elevation Calibrated	(S51)
	D3 = Elevation Zero Limit Switch Active	(S50)
	D2 = Elevation CCW Limit Switch Active	(S49)
	D1 = Elevation CW Limit Switch Active	(S48)
	D0 = Azimuth Encoder Fault	(S47)
5	Status and Fault Conditions	
	D6 = Elevation Joystick A/D Fault	(S60)
	D5 = Azimuth Joystick A/D Fault	(S59)
	D4 = Remote Mode	(S58)
	D3 = EEPROM Memory Fault	(S57)
	D2 = Front Panel Switch Flickering	(S56)
	D1 = Elevation Encoder Fault	(S55)
	D0 = Elevation Software CCW Limit	(S54)
6	Status and Fault Conditions	
	D6 = Reserved	
	D5 = Reserved	
	D4 = Reserved	
	D3 = Reserved	
	D2 = Reserved	
	D1 = Elevation Calibration Done	(S62)
	D0 = Azimuth Calibration Done	(S61)

7	Status and Fault Conditions	
	D6 = Reserved	
	D5 = Reserved	
	D4 = Serial Communications Fault	(S63)
	D3 = Reserved	
	D2 = Reserved	
	D1 = Reserved	
	D0 = Reserved	
8	END OF MESSAGE (FF Hex)	

Table C–15: Gigacom Transmitter BITE Packet (RCP02 to Host)

The RCP02 will generate this BITE packet whenever the dual-Gigacom transmitter interface has been enabled. The identification byte is selectable, so that conflicts with other BITE packets can be avoided, and separate BITE records are sent for each of the two transmitter units.

Char	**Function**
1	SYNC Byte (C0 Hex)
2	Identification byte (User Choice, same as for Q-BITE packets)
3	Status and Fault Conditions
	D6 = Modulator Average Current Fault
	D5 = Airflow Fault
	D4 = Modulator Over Duty Cycle Fault
	D3 = Reserved
	D2 = Modulator Under Duty Cycle Fault
	D1 = HVPS Fault
	D0 = AUX Fault
4	Status and Fault Conditions
	D6 = Power Factor Converter Fault
	D5 = Heater Window Fault
	D4 = Reserved
	D3 = Modulator Over Temperature
	D2 = HVPS Over Temperature Fault
	D1 = Modulator Fault
	D0 = Magnetron Over Temperature Fault
5	Status and Fault Conditions
	D6 = Reserved
	D5 = Reserved
	D4 = Heater Not Ready
	D3 = High Voltage Enabled
	D2 = Local Mode (1), Remote Mode (0)
	D1 = Reserved
	D0 = Power Factor Converter Over Temperature

6 Status and Fault Conditions
- D6 = Reserved
- D5 = Reserved
- D4 = AUX I/O #1 Output (0), Input(1)
- D3 = AUX I/O #1 Fault
- D2 = Reserved
- D1 = Reserved
- D0 = Reserved

7 Status and Fault Conditions
- D6 = Reset command was just sent
- D5 = RCP02 "OR" of Gigacom Fault Bits
- D4 = Serial Communications Error
- D3 = Reserved
- D2 = Reserved
- D1 = AUX I/O #2 Output (0), Input (1)
- D0 = AUX I/O #2 Fault

8 Common status bits (independent of selected unit)
- D6 =
- D5 =
- D4 = State of "gtx_chanb" variable
- D3 = State of "gtx_trans" variable
- D2 = State of "gtx_reqb" variable
- D1 = State of "gtx_hold" variable
- D0 = State of "gtx_auto" variable

9 END OF MESSAGE (FF Hex)

Table C–16: Gigacom Transmitter Q-BITE (RCP02 to Host)

The RCP02 will generate this Q-BITE packet whenever the dual-Gigacom transmitter interface has been enabled. The identification byte is selectable, so that conflicts with other Q-BITE packets can be avoided, and separate Q-BITE records are sent for each of the two transmitter units.

Char	Function	
1	SYNC Byte (AF Hex)	
2	Identification byte (User Choice, same as for BITE packets)	
3–4	HVPS Voltage	(0 to 2.50KV, by 0.01KV)
5–6	HVPS Current	(0 to 5A, by 0.1A)
7–8	HVPS Temperature	(0 to 250°C, by 1°C)
9–10	Heater Voltage	(0 to 10V, by 0.1V)
11–12	Heater Current	(0 to 15A, by 0.1A)
13–14	Modulator Current	(0 to 50mA, by 1mA)
15–16	IGBT Temperature	(0 to 250°C, by 1°C)

17–18	PFC Temperature	(0 to 250°C, by 1°C)
19–20	Control Temperature	(0 to 250°C, by 1°C)
21–22	Reserved	
23	END OF MESSAGE (FF Hex)	

Table C–17: MELCO TKY01 Q-BITE (RCP02 to Host)

The RCP02 will generate this Q-BITE packet whenever the MELCO TKY01 serial packets are enabled. The identification byte is selectable, so that conflicts with other Q-BITE packets can be avoided. The packet will be sent whenever there is a change in any of the data values, as long as there has been at least one second since the last transmission. Also, when this mode is enabled, S63 will be set according to whether the incoming TKY01 stream has timed out (no data for three seconds or more).

Char	Function
1	SYNC Byte (AF Hex)
2	Identification byte (User Choice)
3–6	Generator running hours
7–8	Generator fuel level
9–10	Generator V1 voltage
11–12	Generator V2 voltage
13–14	Generator V3 voltage
15	END OF MESSAGE (FF Hex)

Table C–18: BITE Interrogate Packet (Host to RCP02)

The BITE "interrogate" packet is a request to a remote device that it immediately reply with its current BITE packet(s). This is how the local device can insure that it has the most recent valid data.

The RCP02 will send BITE "interrogate" packets to the host computer whenever the RCP02 is expecting to receive BITE packets of any sort. These RCP02 "interrogate" requests are sent every 30 seconds beginning at startup. This insures that all control bits will be valid in the RCP02 immediately upon startup, and will resume their correct states after any serial line interruptions.

The RCP02 responds to incoming BITE "interrogate" packets by sending the current version of all BITE status packets that it is configured to output.

Char	Function
1	SYNC Byte (C0 Hex)
2	Command (4D Hex means Interrogate)
3	END OF MESSAGE (FF Hex)

Table C–19: Chat-Mode Packet

These packets are sent in both directions to convey serial TTY communication. Up to six 7-bit characters can be sent in each packet with two characters of overhead for SYNC and END. This allows up to 75% of the available serial bandwidth to be used for chatting. If a "chat-mode" packet contains fewer than six characters, then a NULL (zero byte) is inserted after the last one.

Char	Function
1	SYNC Byte (F1 Hex)
2...7	7-Bit ASCII characters (possibly NULL terminated)
8	END OF MESSAGE (FF Hex)

Table C–20: Background Operation Packet

These packets are sent in both directions to control background operations within the RCP02. They are for proprietary use by SIGMET only.

Char	Function
1	SYNC Byte (F6 Hex)
2	D6: Reserved D5: Reserved D4: Data=0, Command=1 D3–D0: 32-Bit Data/Cmd Word (Bits 31–28)
3	32-Bit Data/Cmd Word (Bits 27–21)
4	32-Bit Data/Cmd Word (Bits 20–14)
5	32-Bit Data/Cmd Word (Bits 13 – 7)
6	32-Bit Data/Cmd Word (Bits 6 – 0)
7	END OF MESSAGE (FF Hex)