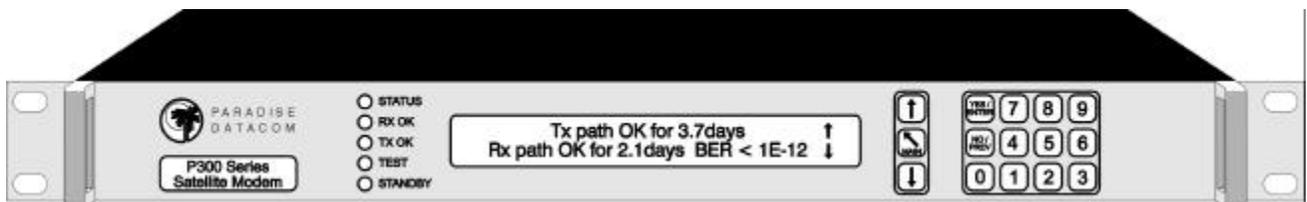


PARADISE
DATACOM

Technician's P300 Initial Setup & Typical Configurations Guide



***IF YOU DIDN'T READ THE P300 MANUAL,
YOU SHOULD READ THIS!***

This is the “short” version of what info you need to know to configure your modem and setup your satellite link.

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1. What you need to know beforehand

Thanks for your interest in Paradise Datacom's P300 series modems! While deep technical detail can be found in the P300 Installation and Operating Handbook, The intent of this document is to provide "quick and dirty" initial setup and configuration for the P300 modem. Below are some questions you should answer concerning the circuit the P300 modems are going to be used in, as this will help you decide which options and settings you may need to select in the modems.

Also in this document are typical configurations that are known to work, a blank "P300 Initial Setup" form for your own use (chock full of tech notes), and a list of the available options in the P300.

Here is what you need to find out about the satellite circuit the P300 modems are going to be used in, in order to better understand which options and settings you may need to select:

- Terrestrial data coming into / out of the modems.
 1. What electrical standard is it? V.35, RS422, RS232, Full T1, Fractional T1, Full E1, Fractional E1?
 2. Do you need an adapter to connect to our EIA-530 25 D connector? Are you aware that some external equipment manufacturers sell a compatible cable (such as Cisco's CAB-530MT), or adapters (such as Black Box's #FA058 EIA-530 to V.35 adapter)?
 3. Is the E1 going to use the BNC's (75 Ohm), or the EIA-530 25D connector (120 Ohm)?

- Details of the data stream:
 - E1 questions:
 1. Is it to be full E1 @2048 kbps, or fractional E1 using some or all of the 32 timeslots (each TS is 64kbps)?, If so, which timeslots carry the TS ID maintenance info?
 2. Is it using common channel signaling (CCS) or channel associated signaling (CAS)?
 3. Are you using an "odd" number of timeslots per Intelsat IBS specifications?
 4. Do you require an engineering service channel to maintain TS ID?
 - T1 questions:
 1. Is it to be full T1 @1544 kbps, or fractional T1 using some or all of the 24 timeslots (each TS is 64kbps)?
 2. Is it using robbed bit signaling (RBS)?
 3. Are you using an "odd" number of timeslots per Intelsat IBS specifications?
 4. Do you require an engineering service channel to maintain TS ID?

- Common questions for all data stream types:
 1. Do you know what type of service you wish to use (Closed, Closed+ESC, IBS, IDR)?
 2. If using continuous (vs. Drop & Insert) baseband data rate do you know what the desired baseband rate is to be?
 3. What type of forward error correction do you want and at what rate?
 4. Do you wish to use Reed – Solomon outer codec?
 5. What type of clocking do you intend you use (from external equipment, internal, or from the satellite)?
 6. Do you want to use two separate clocks or one single clock in the system, and if so which end is the clock being derived from and which end is going to loop it back?
 7. Do you need special scramblers?
 8. Do you need to invert the spectrum?

- Details of the RF stream:
 1. What are the Tx and Rx IF frequencies?
 2. Do you know how much bandwidth you have for your spectrum?
 3. Do you know how different services, baseband rates, FEC rates, and Reed – Solomon affect the width of the output spectrum, and have you calculated the settings for all these beforehand?

Some advice (from experience) on how to test the modems and the complete system: While it's easy to get confused which modem setting produces which result, or which option you may need, just remember to take small steps while you set up and test the P300 modems. Make sure the P300 modems can first talk to your test equipment by itself (please refer to Fig 1).

Some notes on using Cisco routers, which may be also applicable to other external equipment as well. Usually, all Cisco routers require both the Paradise modem's electrical interface control lines be set to "Active". Also occasionally, there needs to be set in the Cisco router the command to ignore the DCD line ("ignore-dcd"). This appears to have some bearing on what manufacturer made the interface for Cisco, the Cisco model you are using, and whether it is a single vs. multiple interface. So, if you are having trouble interfacing with a Cisco router, try entering this command in the Cisco router.

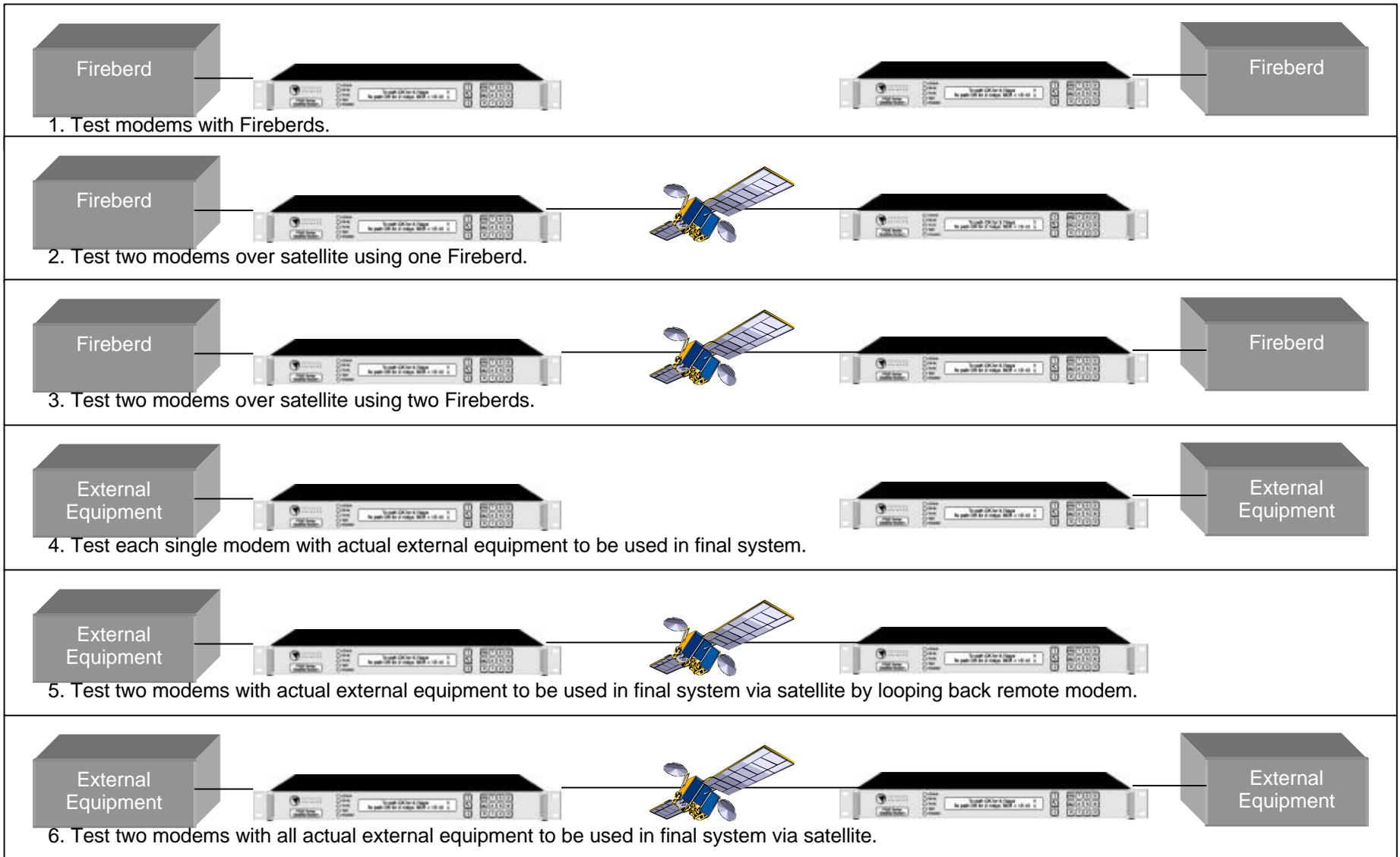
There cannot be enough said about the importance of correct clocking setups. Nothing will work right without correct clocking, and you may have to alter your clocking selections during different tests and operations (if you see the status message "No clock from interface" this means there isn't a clock coming into the modem from the external equipment). You should set the AIS (all 1's) to "Ignore", because otherwise a bad cable or with no data coming into the modem, it will fault and the "Tx OK" front panel LED will go off (although the Tx continues to output a spectrum), causing any loopback tests to fail (to set AIS to "Ignore" press Main, 2, 5, 2, Yes, 2, 3, 1). The Reed – Solomon feature shouldn't be on during testing as this hides other setup problems (if you see the status message "De-Interleaver sync loss" then turn off RS until everything else is working correctly).

Also, there is an internal Bit Error Rate Tester (BERT) built into the P300 modem (req.'s Option K and flash software >=2.46). You can use this if you do not have access to a Fireberd or other test equipment.

Then progress step by step towards the final configuration using the external equipment that will be used in the final configuration (as shown in Fig 1.). Also remember that while a particular setup with test equipment may work between two modems over the satellite, the link may not work when you attach external data equipment to the P300 modems. Remember that those external pieces of equipment need setup, too!

For tech support, sales, or any other information, contact Paradise Datacom LLC:
Tech support & Sales phone number is 814-466-6275, weekdays 8:00-4:30pm ET.
Tech support & Sales fax number is 814-466-3341.
Email sales@paradisedata.com.

2. Recommended Testing Steps:



3a.-3f. Typical Configurations:

Typical Configurations:	3a. V.35/RS422/RS232 to V.35/RS422/RS232:		3b. Fractional T1(E1) to V.35/RS422/RS232		3c. Full T1 (E1) to Full T1 (E1):	
Selection:	1st modem:	2nd Modem:	1st modem:	2nd Modem:	1st modem:	2nd Modem:
Service	Closed	same as 1st Modem	Closed	same as 1st Modem	Closed	same as 1st Modem
Tx BB rate	2048kbps	same as 1st Modem	Drop TS 1-16	1024kbps	1544(2048)kbps	same as 1st Modem
Tx Clk Mode	Tx Clk In	Tx=Rx	Tx Clk In	Tx=Rx	Tx Clk In	Tx=Rx
TX IF Freq.	As desired	as desired	as desired	as desired	as desired	as desired
Mod	QPSK	same as 1st Modem	QPSK	same as 1st Modem	QPSK	same as 1st Modem
FEC type	Viterbi	same as 1st Modem	Viterbi	same as 1st Modem	Viterbi	same as 1st Modem
FEC rate	1/2	same as 1st Modem	1/2	same as 1st Modem	1/2	same as 1st Modem
RS	On	same as 1st Modem	On	same as 1st Modem	On	same as 1st Modem
Scrambler	Normal	same as 1st Modem	Normal	same as 1st Modem	Normal	same as 1st Modem
Tx pwr	as needed	as needed	as needed	as needed	as needed	as needed
Tx carr.	On	On	On	On	On	On
Spect Inv	Normal	same as 1st Modem	Normal	same as 1st Modem	Normal	same as 1st Modem
AUPC	Off	same as 1st Modem	Off	same as 1st Modem	Off	same as 1st Modem
ESC/AUX BA	n/a	n/a	n/a	n/a	n/a	n/a
Set Rx=Tx	On	On	On	On	On	On
Station Clk	None	None	None	None	None	None
Rx Clk	Sat	Sat	Insert Bearer: Loop, TS 1-16, Backup Bearer Clk source Sat, Buffer = 4mS	Sat	Insert Bearer: Loop, TS 1-16, Backup Bearer Clk source Sat, Buffer = 16mS	Insert Bearer: Loop, TS 1-16, Backup Bearer Clk source Sat, Buffer = 16mS
Rx IF Freq	As desired	as desired	as desired	as desired	as desired	as desired
Demod Sweep	Auto	Auto	Auto	Auto	Auto	Auto
Set Elect. Intfc	As desired	as desired	G.703, ESF(HDB3)	As desired	G.703, ESF (HDB3)	G.703, ESF (HDB3)
Opt. Param.	Set to Norm & Skip	Set to Norm & Skip	Set to Norm & Skip	Set to Norm & Skip	Set to Norm & Skip	Set to Norm & Skip
Rem M&C	Off	Off	Off	Off	Off	Off
Typical Configurations:	3d. Fractional T1(E1) to Fractional T1(E1) where remote modem receives T1(E1) framing from attached equipment:		3e. Fractional T1(E1) to Fractional T1(E1) where remote modem supplies T1(E1) framing to attached equipment:		3f. Fractional T1 to Fractional E1:	
Selection:	1st modem:	2nd Modem (remote):	1st modem:	2nd Modem (remote):	1st modem (T1):	2nd Modem (E1):
Service	Closed + ESC	same as 1st Modem	Closed + ESC	same as 1st Modem	Closed + ESC	Closed + ESC
Tx BB rate	Drop Mux, TS 1-8	same as 1st Modem	Drop Mux, TS 1-8	same as 1st Modem	Drop Mux, TS 1-24	Drop Mux, TS 1-24
Tx Clk Mode	Tx Clk In	Tx=Rx	Tx Clk In	Tx=Rx	Tx Clk In	Tx Clk In
TX IF Freq.	As desired	as desired	As desired	as desired	as desired	as desired
Mod	QPSK	same as 1st Modem	QPSK	same as 1st Modem	QPSK	same as 1st Modem
FEC type	Viterbi	same as 1st Modem	Viterbi	same as 1st Modem	Viterbi	same as 1st Modem
FEC rate	1/2	same as 1st Modem	1/2	same as 1st Modem	1/2	same as 1st Modem
RS	On	same as 1st Modem	On	same as 1st Modem	On	same as 1st Modem
Scrambler	Normal	same as 1st Modem	Normal	same as 1st Modem	Normal	same as 1st Modem
Tx pwr	as needed	as needed	as needed	as needed	as needed	as needed
Tx carr.	On	On	On	On	On	On
Spect Inv	Normal	same as 1st Modem	Normal	same as 1st Modem	Normal	same as 1st Modem
AUPC	Off	same as 1st Modem	Off	same as 1st Modem	Off	same as 1st Modem
ESC/AUX BA	Set baud, bits, parity, ESC Intfc.	Set baud, bits, parity, ESC Intfc.	Set baud, bits, parity, ESC Intfc.	Set baud, bits, parity, ESC Intfc.	Set baud, bits, parity, ESC Intfc.	Set baud, bits, parity, ESC Intfc.
Set Rx=Tx	On	On	On	On	On	On
Station Clk	None	None	None	None	None	None
Rx Clk	Insert Bearer: Loop, TS 1-8, Backup Bearer Clk Source: Sat, Buffer = 16mS	Insert Bearer: Loop, TS 1-8, Backup Bearer Clk Source: Sat, Buffer = 16mS	Insert Bearer: Loop, TS 1-8, Backup Bearer Clk Source: Sat, Buffer = 16mS	Insert Bearer: Generate, TS 1-8, Backup Bearer Clk Source: Sat, Buffer = 16mS	Insert Bearer: Loop, TS 1-24, Backup Bearer Clk source Sat, Buffer = 16mS	Insert Bearer: Loop, TS 1-24, Backup Bearer Clk source Sat, Buffer = 16mS
Rx IF Freq	As desired	as desired	As desired	as desired	as desired	as desired
Demod Sweep	Auto	Auto	Auto	Auto	Auto	Auto
Set Elect. Intfc	G.703, ESF(HDB3)	G.703, ESF(HDB3)	G.703, ESF(HDB3)	G.703, ESF(HDB3)	G.703, ESF	G.703, HDB3
Opt. Param.	Set to Norm & Skip	Set to Norm & Skip	Set to Norm & Skip	Set to Norm & Skip	Set to Norm & Skip	Set to Norm & Skip
Rem M&C	Off	Off	Off	Off	Off	Off

See Notes on next page:

Notes on Typical Setups (from previous page):

1. Any setting not shown or referred to is assumed to be the default setting during Initial Setup.
2. While RS is shown as being used, it is recommended to turn it off when testing (it hides other setup problems).

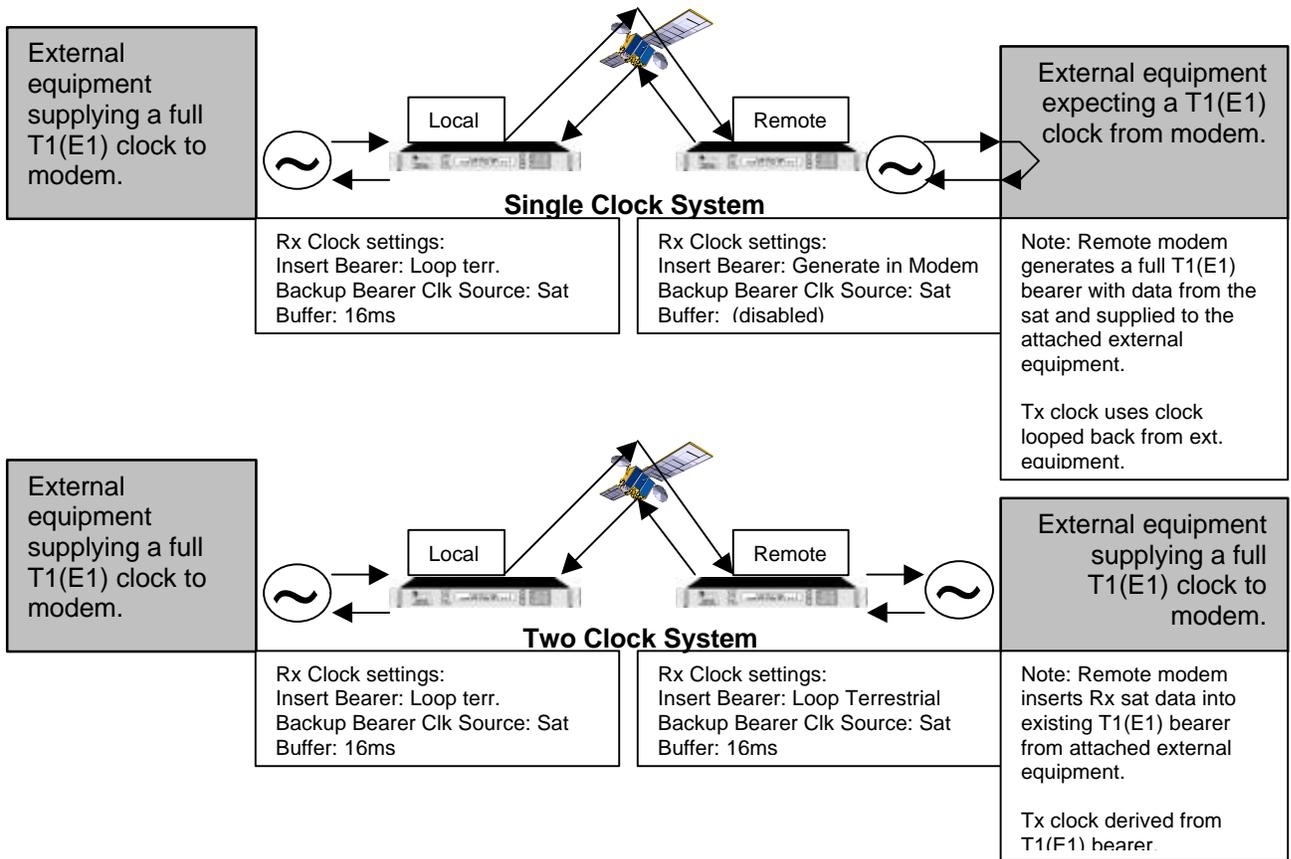
3. For Full T1 to Fractional E1 or Fractional E1 to Full T1 conversion, all 24 T1 timeslots are sent / received from 24 of the 32 TS's of the E1. Basic D&I, and ESC option is definitely required for the TS ID, for all service modes (and possibly Adv. D&I option as well, especially if the E1 bearer is using Channel Associated Signaling (CAS)).

4a. CLOCKING: In all of the above Continuous Baseband examples Modem 1 is the source of the system clock in a single clock circuit, modem 2 is looping the clock back.

4b. In Fractional T1(E1) examples above, modem 1 uses the clock coming in on it's terrestrial connector as the Tx source of one clock, while modem 2 is inserting the data onto the *existing* T1(E1) at the remote end. Then modem 2 uses the second clock coming in on it's terrestrial connector as the Tx source of one clock, while modem 1 is inserting the data onto the *existing* T1(E1) at the local end (requires buffer to be setup at each end). Refer to Example 1 Below.

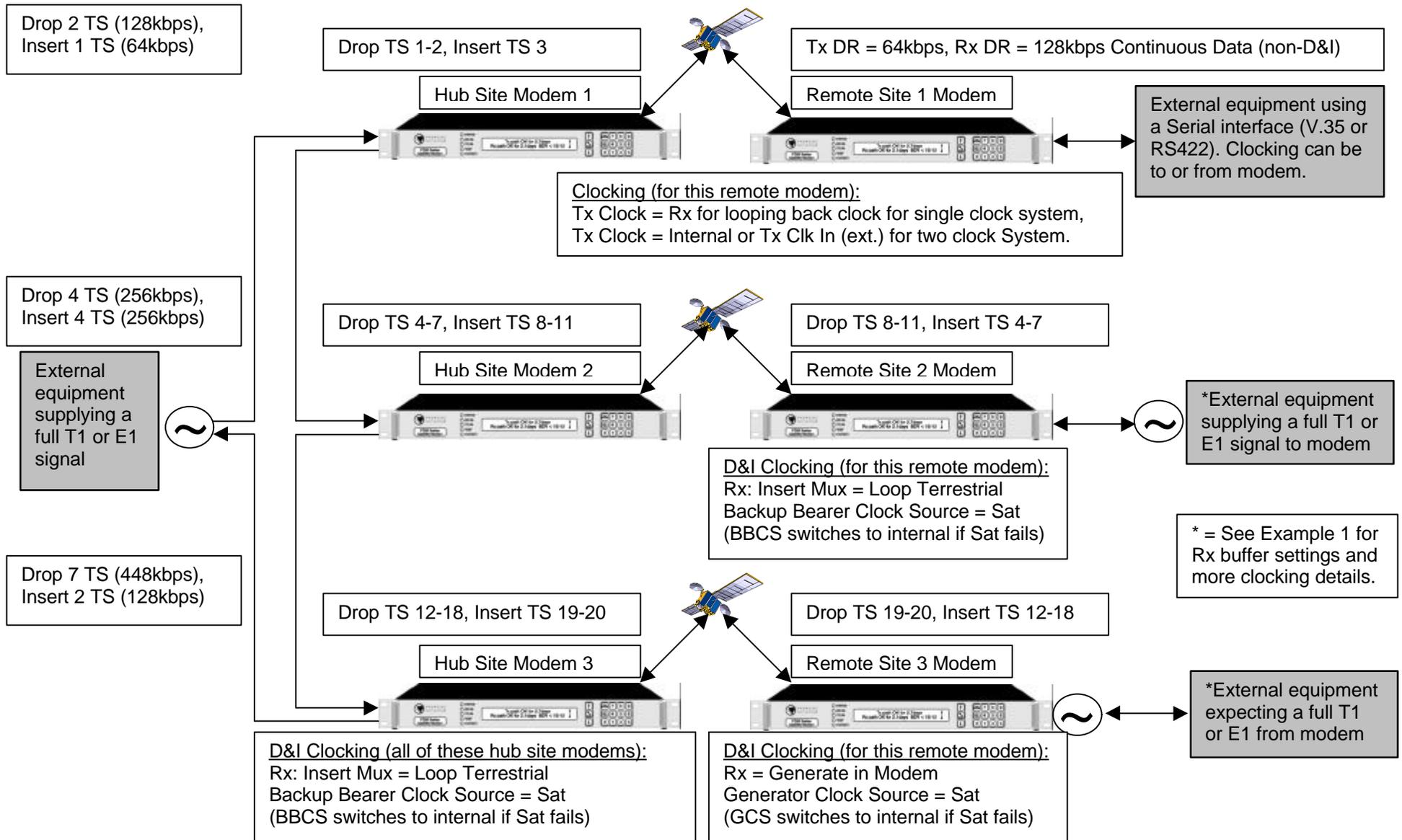
4c. Please Note: If your external equipment at the remote end is expecting the modem to supply a full T1(E1) bearer, you need to setup the Change-Rx-Baseband-Insert Mux menu to "Insert Mux": "Generate in Modem", then set Change-Rx-Buff/Clk-Gen' bearer menu to "Generated bearer clock source" to "Sat". This then will be a single clock system as the external equipment is expected to loop the T1/E1 bearer back to the modem and over the Sat to modem1 (requires buffer to be setup at each end). Refer to Example 1 below.

**D&I Rx Clocking Examples:
Example 1**



4. Example of different possible satellite link schemes:

- Hub site is using a cascaded T1/E1 Drop & Insert (D&I) scheme to link to several different sites to a single T1/E1 bearer (TimeSlots 1-20).
- Remote sites are shown using different schemes. In the examples shown below, you can use continuous data with a serial interface on the remote side with the hub site using T1/E1 D&I, or you can generate a T1/E1 bearer with the data from the hub site's T1/E1 bearer & clock, or you can transfer data to/from a remote site's T1/E1 bearer to/from the hub site's T1/E1 bearer.



5. Blank Form:

P300 Initial Setup Form (using "Initial Setup" menus):

Note: To accept existing menu selections press "Yes", to back up one menu step press "No".

Note: This was written using version 3.46 Flash software, and P300 Manual v1.72.

If sub-menu selection isn't shown, the menu jumps to next major menu item (shown in **BOLD**).

- Press **P300** modem keys **Main, 7, 1** for "**Initial Setup**" -

Tx Service [Off]: 1. Off, 2. Closed, 3. IBS/SMS, 4. IDR, 5. Custom **Note:** w/o IDR board
"Custom" is menu item 4.

Req.'s Opt. E | Req.'s Opt. F, H, & J | Req.'s Opt. E+I

Refer to: P300 Installation and Operating Handbook, section 6.6.1 "Change, Tx/Rx, SERVICE menu", and section 6.6.2 "Change, Tx/Rx, Closed Network" menu for more details.

1. Off: **Note:** From here it goes to **Set Rx=Tx**, so most parameters track Tx:

2. Closed:

1. No ESC(normal)

2. Plus ESC (min o/h):

Backward Alarm Facility:

Requires ESC Option G

1. Normal (Back Al'm), 2. No Backward Alarm

5. Custom framing based on: 1. IBS, 2. IDR Req.'s Custom Features Option I

1. Multiframe [?]: 1. Normal, 2. Without a TS 32 Multiframe

1. Backward Alarm [Normal]: 1. Normal, 2. No Backward Alarm facility

1. IBS Backward Alarm [Normal]: 1. Normal (single), 2. Four independent alarms

1-2. Overhead Mode [Normal]: 1. Normal, 2. Min o/h to provide set ESC

1.-2. **Note:** From here it goes to **Tx Baseband**:

2. Backward Alarm [Normal]: 1. Normal, 2. No Backward Alarm facility

1.-2. Overhead mode: 1. Normal, 2. Min o/h to provide set ESC

1.-2. **Note:** From here it goes to **Tx Baseband**:

Req.'s IBS, ESC, & Custom Features, Options E+G+I

2. Framing based on: 1. Low rate format (T1/E1), 2. High rate format (T2/E2)

1.-2. IDR o/h: 1. Normal:96k, 2. 1xAudio:64k, 3. No Audio:32k, 4. 16k ADPCM mode.

1.-3. **Note:** From here it goes to **Tx Baseband**:

4. IDR o/h: 1. 96k:2x16k-Audio+32k-BER, 2. 64k:2x16k-Audio only

1.-2. **Note:** From here it goes to **Tx Baseband**:

Req.'s IDR bd & IDR opt.'s, ESC, & Custom Features, Options F+G+H+I+J

Tx Baseband [Cont]: 1. Continuous Data, 2. Drop Mux, 3. Other function Req.'s IDR bd + Option J

Refer to: P300 Installation and Operating Handbook, sections 6.6.3-6.6.6 that deal with Tx baseband, section 8.3 "Partial Insert and Multidestinational Working", section 8.7 "Closed Network Plus ESC", section 8.7.2 "Closed Network Plus ESC via the Custom Service Menu", and section 8.8 "Cross Reference To SDM300 D&I Framing Modes" for more details.

1. Continuous Data:

Set Tx terrestrial data rate: _____ bps
[as desired].

Option P is standard and is for 4.8k-512K,
Options P+R req.'d for full range from 4.8k-5M.

Note: IBS service mode w/ 2048 continuous data: This is a special case in which there are two modes of operation. These modes are confusingly referred to as 1920/1984kbps and 2048kbps modes in the IBS service definitions, but both operate with a 2048 terrestrial data rate. If you chose these settings you will get the following menus:

Refer to: P300 Installation and Operating manual, section 6.6.4, "Change, Tx/Rx, Baseband, CONTINUOUS menu", and section 7.2 "IBS/SMS Operation with 2048kbps Continuous Data" for more details.

2048k IBS mode(Normal): 1. Normal (6.7% o/h), 2. G.732 (0% o/h)

2. CAS (Chan' Assoc Sig) in TS16: 1. Normal (No CAS, N=31), 2. CAS (n=30)

1. & 2. Timeslot re-order option: 1. Normal (linear), 2. Re-order

2. TS order: Toggle: ??-?? _____

[Enter desired timeslots to reorder]

Req.'s IBS Option E

Note: From here it goes to **Set upconverter freq shift to display/edit Tx freq at antenna**:

2. Drop Mux: Requires D&I Option C
Refer to: P300 Installation and Operating Manual, section 6.6.1 "Change, Tx/Rx, SERVICE Menu", and Appendix F, IDR Framing for more details.
Note: If you chose IDR Service mode, you will get the message "Info: IDR service at low rates uses IBS o/h. IDR selected, continue? Yes/No". "Yes" will continue to Select Drop Bearer: (see below), "No" will back up two steps to Tx Service:, indicating that if you don't want to use IBS overhead, you may select another service.

Select Drop Bearer: 1. G.732 [E1], 2. T1-D4, 3. T1-ESF
 1-3. Drop TS: Toggle: ??-?? _____ (Yes) \uparrow Help
 *See Note 1 \uparrow eg enter 4 to toggle TS4, enter 1317 to toggle TS13-17 \downarrow
 Dropped TS: 1. Leave, 2. Replace with idle code
 *See Note 2

[E1] G.732 Chan Assoc Sig in TS16: 1. Normal (ignore), 2. Transfer in sat o/h
 [T1] T1 RBS over satellite: 1. Normal (or no RBS), 2. Maintain RBS Requires Adv. D&I Option D
 *See Note 3
 1. Timeslot identity will be maintained by normal TS32 Multiframe (Yes)
Note: From here it goes to **Set upconverter freq shift to display/edit Tx freq at antenna:**.

3. Other Function: Requires IDR & IBS Options F,H,J, & E, + IDR board
Refer to: P300 Installation & Operating Handbook, section 6.6.6 "Change, Tx/Rx, Baseband, OTHER Menu", for more details.

Audio/Data mux (P1348/P1448 emulation): 1. Audio, 2. Audio+64k Data \downarrow
 Can emulate Audio/Data mux card using IDR ESC Audio + data port, see h/b \uparrow

Note 1: If you are using E1, you need to determine whether the data coming into the modem is using Common Channel Signaling (CCS) or Channel Associated Signaling (CAS).
 Using CCS is a grey area. If it is using CCS, our engineers say you must use a timeslot to carry the CCS framing information (it doesn't matter which TS) in addition to the selected data timeslots you desire. This CCS framing information must be sent over the 'sat link to the other modem. However, in talking with customers that are using CCS, you do not need an extra timeslot to carry the CCS framing. In either case, you also need to configure the modem's ESC for use when using IBS or Closed + ESC, as the timeslot ID maintenance information is carried in the ESC overhead of IBS or Closed Network + ESC service. **Note:** Timeslot 16 (normally used for CAS framing information) is available for use as as data timeslot when using CCS. **Note:** You cannot use timeslot 0 as it's for other framing info.

If it is using CAS, you need to select timeslot 16 in addition to the desired timeslots, as the CAS framing information is carried in TS16. Timeslot ID maintenance information is carried in the overhead of IBS service (per IBS specification), or the ESC portion of Closed Network + ESC. Again, the ESC is where the TS ID maintenance information is carried. **Note:** You cannot use timeslot 0 as it's for other framing info.

For E1-CCS, E1-CAS, or T1, these are all the option features you need to use if you have an "even" number of timeslots (see Note 3 below). If you are using an "odd" number of timeslots (see Note 3 below), in addition to the above configuration for "even", you must use the "Advanced D&I" option feature, as this is allows the use of "odd" values of timeslots.

Note 2: When Closed Network with no ESC is chosen for the desired service at this point you will get the message "With Closed Net there is no TS ID Maint' – Use IBS/SMS or Closed+ESC". If you require TS ID maintenance (always recommended), you must select Closed+ESC, IBS, or IDR service. Otherwise, It will then go to the next step, "Set upconverter freq shift to display/edit Tx freq at antenna:". **Please Note:** No TS ID will be transmitted to the external equipment which will require it. However, Fireberd testers don't require it when setup for fractional T1 or E1, so while you may think a link is setup correctly, when you connect the external equipment to the modems, the data will not pass through the link correctly.

Note 3: Without the advanced D&I feature, you will get the message "TS identity maintenance not available". It then proceeds to the next step, "Set upconverter freq shift to display/edit Tx freq at antenna:".
 The *message* "TS identity will be maintained over satellite by normal TS32 multiframe (Yes)" will appear if you have an "even" number of timeslots, and you have the advanced D&I feature.
 The *menu* "TS identity over satellite:" will appear if you have an "odd" number of timeslots, and advanced D&I. From which you choose 1. Normal (Ignore [E1] or No RBS [T1]) or 2. (Transfer in sat o/h [E1] or Maintain RBS [T1]), to which you should select "1". You will then get the menu "TS Identity over satellite: 1. Maintain (normal), or 2. Don't care, to which you should select "1".
 Even number of timeslots for both T1 and E1 are: 0-6, 8, 10, 12, 15, 16, 20, 24, 30.
 Odd values of timeslots for both T1 and E1 are: 7, 9, 11, 13, 14, 17, 18, 19, 21-23, 25-29, 31.

Tx Clock Mode [Tx Clk In]: 1. Tx clock in 2. Internal 3. Rx ref (=sat)

Refer to: P300 Installation & Operating Handbook, section 6.6.7 "Change, Tx, CLOCKING Menu", and sections 8.1-8.2.3 that deal with clocking and buffers for more details.

Note: The message "Tx Clocking fixed as 'Tx clock in' for this base band mode" will appear instead of Tx clocking menu if you chose Drop Mux under the Tx baseband section. This will also appear if you chose Audio+64k under Other functions under the Tx baseband section.

Note: The message "Tx Clocking fixed as 'Internal' for this base band mode" will appear instead of Tx clocking menu if you chose Audio under Other functions under the Tx baseband section.

Set upconverter freq shift to display/edit Tx freq at antenna [No]: 1. Yes 2. No

1. Freq shift of upconverter [0]:

(0-65535MHz) ????? (Yes)

Tx Antenna frequency: [xxxx.xxxx]MHz

?????.???? (Yes) ↓ IF/SHF+Limits

↑ Tx range: xxxx...xxxxMHz (Step 100Hz)
(inc U/C shift of xxxxMHz)

Note: From here it goes to **Set Modulation:**.

Note: If any of the above selections are not available (shown), the selection numbers decrement by one digit. For example, if Sequential is not available, TCM is #3, and Turbo is #4.

Set Tx IF Frequency [70.0000]MHz:

Refer to: P300 Installation & Operating Handbook, section 6.6.9 "Change, Tx/Rx, Modulator, IF FREQUENCY Menu" for more details.

?????.???? (Yes) IF/SHF+Limits

Tx range: 50-90MHz (Step 100Hz) **or** Tx range: 50...180MHz (Step 100Hz) Req's option T for 50-190MHz.

Set Modulation [QPSK]: 1. BPSK, 2. QPSK, 3. OQPSK, 4. 8PSK Req's option O.

Refer to: P300 Installation & Operating Handbook, section 6.6.10 "Change, Tx/Rx, Modulator, MODULATION Menu" for more details.

Select Tx FEC [None]: 1. None, 2. Viterbi, 3. Sequential,..... 4. TCM rate 2/3, 5. Turbo
Req's option M + Seq. bd. Req's option O. Req's option W + Turbo Bd.

Refer to: P300 Installation & Operating Handbook, section 6.6.11 "Change, Tx/Rx, Modulator, FEC Menu" for details.

1. None: **Note:** From here it goes to **Tx RS outer codec:**.

Select FEC Rate:

Refer to: P300 Installation & Operating Handbook, section 6.6.11 "Change, Tx/Rx, Modulator, FEC Menu" for more details

For Viterbi & Sequential FEC: 1. Rate 1/2, 2. Rate 3/4, 3. Rate 7/8

For TCM FEC: 1. Rate 2/3

For Turbo FEC: Select Turbo Mode/Code rate, then (Yes)

- [0.493 Paradise 1/2 rate] ↑ ↓
- [0.666 Paradise 2/3 rate] ↑ ↓
- [0.750 Industry de-facto 3/4 rate] ↑ ↓
- [0.789 Paradise 3/4 rate] ↑ ↓
- [0.875 Paradise 7/8 rate] ↑ ↓
- [0.3125 Paradise 5/16 rate] ↑ ↓
- [0.477 Industry de-facto 21/44 rate] ↑ ↓

Tx RS outer codec [Off]: 1. Off, 2. INTELSAT n,k,t, & depth, .. 3. Other
Req.'s Reed-Solomon Option L Req.'s Reed-Solomon + Custom Features for arbitrary n&k values of RS. Options L+ I

Refer to: P300 Installation & Operating Handbook, section 6.6.12 "Change, Tx/Rx, Mod/Demod, REED-SOLOMON Menu", and section 8.4 "Choosing Optimum Custom Values of RS N&K" (this req.'s Option I), and section 8.5 "Notes On Data Rates & Symbol Rates" for more details.

Note: Standard INTELSAT RS values for n,k,t,d (Option L) are:

TCM, IDR @2048kbps = 219,201,9,8.

IBS, Closed, or IDR (except 1544 & 2048 kbps) = 126,112,7,4.

IDR @ 1544kbps = 225,205,10,4

To select other RS values requires the use of Option I, "Custom Features, including arbitrary n&k values of RS, Custom & minimum overhead framing modes (with IBS or IDR options), and Custom allocation of IBS overhead between ESC and Aux channels".

Select Scrambler [Normal]: 1. Off, 2. Normal, 3. Other

Refer to: P300 Installation and Operating Handbook, section 6.6.13 "Change, Tx/Rx, Mod/Demod, Scrambler Menu", and section 8.9 "V.35 Scramblers" for more details on each of the different scramblers.

Note: "Normal" automatically selects the appropriate scrambler based on the current configuration and enables it (always the recommended selection, however there are situations that require other styles of scrambling, especially when connecting with other manufacturer's modems).

Note: To access "Other" scramblers, press 3 ("On!" will appear in brackets), then press "Yes".

3. Other: Toggle Scramblers: 1. Sync IBS, 2. Sync RS...
Req.'s Option L 3. V.35 Style

3. V35 style scrambler: 1. CCITT, 2. INTELSAT, 3. FDC, 4. Linkabit

Note: You can turn on any scramblers simultaneously including one of the "Other" scramblers.

However, you will see the message "Tx Config Info: There are multiple scramblers active" if you have more than one scrambler active, after you complete the Initial Setup and view the status screen.

Set Tx path gain to display/edit power at antenna [No]: 1. Yes 2. No

1. Tx path gain from modem output [0.0]: (for +/-) + ???.? (Yes)

Note: If 0.0 is entered, from here it goes to **Tx pwr:**.

Set units for Tx Level including gain [dBm]: 1. dBm 2. dBW

1. Will this give Tx Power or EIRP [Tx Power]: 1. Tx Power 2. EIRP

1. TxPwr (+x.x to -xx.x) Now [xx.x]dBm: 1. Set value 2. Nudge up/dn

1. TxPwr (+x.x to -xx.x) Now [xx.x]dBm:

Set TxPwr (for +/-) + ???.? (Yes)

Note: From here it goes to **Tx carrier:**.

2. TxPwr (+x.x to -xx.x) Now [+x.x]dBm:

TxPwr nudge (slow 0.1/fast0.5db, Yes)

Set 'nudged' Tx power as Tx level: 1. Set 2. Restore original power

Note: From here it goes to **Tx carrier:**.

2. EIRP (+x.x to -xx.x) Now [xx.x]dBm: 1. Set value 2. Nudge up/dn

1. EIRP (+x.x to -xx.x) Now [xx.x]dBm:

Set EIRP (for +/-) + ???.? (Yes)

Note: From here it goes to **Tx carrier:**.

2. EIRP (+x.x to -xx.x) Now [+x.x]dBm:

EIRP nudge (slow 0.1/fast0.5db, Yes)

Set 'nudged' Tx power as Tx level: 1. Set 2. Restore original power

Note: From here it goes to **Tx carrier:**.

2. Will this give Tx Power or EIRP [Tx Power]: 1. Tx Power 2. EIRP

1. TxPwr (+x.x to -xx.x) Now [xx.x]dBW: 1. Set value 2. Nudge up/dn

1. TxPwr (+x.x to -xx.x) Now [xx.x]dBW:

Set TxPwr (for +/-) + ???.? (Yes)

Note: From here it goes to **Tx carrier:**.

2. TxPwr (+x.x to -xx.x) Now [+x.x]dBW:

TxPwr nudge (slow 0.1/fast0.5db, Yes)

Set 'nudged' Tx power as Tx level: 1. Set 2. Restore original power

Note: From here it goes to **Tx carrier:**.

2. EIRP (+x.x to -xx.x) Now [xx.x]dBW: 1. Set value 2. Nudge up/dn

1. EIRP (+x.x to -xx.x) Now [xx.x]dBW:

Set EIRP (for +/-) + ???.? (Yes)

Note: From here it goes to **Tx carrier:**.

2. EIRP (+x.x to -xx.x) Now [+x.x]dBW:

EIRP nudge (slow 0.1/fast0.5db, Yes)

Set 'nudged' Tx power as Tx level: 1. Set 2. Restore original power

Note: From here it goes to **Tx carrier:**.

Tx pwr (0 to -25dBm) [-25.0]: New value ???.? _____ dBm or nudge, \uparrow \downarrow then YES.
[Enter desired power level]

Refer to: P300 Installation and Operating Handbook, section 6.6.15 "Change, Tx, Modulator, Power Level Menu" for more details.

If you 'nugged' the level, and pressed "Yes" you will see the menu:
Set 'nugged' Tx power as Tx level: 1. Set, 2. Restore original power.

Tx Carrier [Off]: 1. Off, 2. On, 3. On + Mute if pwr break, 4. Intfc RTS enabled.

Refer to: P300 Installation and Operating Handbook, section 6.6.14 "Change, Tx, Modulator, Carrier Menu" for more details.

Tx spectrum invert [Normal]: 1. Normal, 2. Invert

Refer to: P300 Installation and Operating Handbook, section 6.6.16 "Change, Tx/Rx, Mod/Demod, SPECTRUM INVERT Menu" for more details.

Note: "Normal" is always the preferred selection, however there are situations that require other spectrum compatibilities, especially when connecting with other manufacturer's modems.

Set AUPC Mode [Off]: 1. Off, 2. Mon dist', 3. Maint', 4. Self mon. Req.'s AUPC + ESC Option Z + G

Refer to: P300 Installation and Operating Handbook, sections 6.6.17-6.6.24 that deals with AUPC, and section 8.11 "Introduction to AUPC" for more details on Automatic Uplink Power Control.

3-4. Maint' & Self mon:

Set AUPC max positive delta power: ???.?db (0-25.0db) _____
[Enter desired db]

Set AUPC max negative delta power: ???.?db (0-25.0db) _____
[Enter desired db]

Set maximum power slew rate: ???.?db/min (.1-99.9db/min, 0=no limit) _____
[Enter desired db/min]

Set target Eb/No to maintain: (0 to 25.0db) ???.?db _____
[Enter desired db]

Set Eb/No tolerance before AUPC action: (0.1-25.0db) +/- ???.? _____
[Enter desired db]

Set AUPC power on comms loss: 1. Freeze, 2. Nominal, 3. Maximum

ESC/AUX/BA input Baud rate:

Refer to: P300 Installation and Operating Handbook, section 6.6.25-6.6.35 that deals with ESC/AUX/BA in all the different service modes for more details.

Note: This menu differs between Closed Network + ESC, IBS/SMS, IDR, and Custom service modes. All are shown for your convenience, disregard the other services you are not using.

ESC/AUX/BA; [Closed Network + ESC]:

[2400] \uparrow \downarrow (overhead will vary to accommodate) _____

[Use up /down keys to select Baud rate, and press Yes to accept]

Tx ESC input: 1. 7, 2. 8, 3. None, 4. Even, 5. Odd

Tx & Rx ESC Interface: 1. RS232, 2. RS422, 3. RS485, 4. Link to M&C

4. Internal link to M&C port: 1. Local (M&C PC end), 2. Remote end

Req.'s ESC Option G

ESC/AUX/BA; [IBS/SMS], &[Custom – IBS]:

Tx Aux Port [Off]: 1. Off, 2. Intelsat Low rate, 3. Sync Channel Req.'s IDR bd, + Options F, H, & J

1. & 2. Tx ESC Port [Off]: 1. Off, 2. High rate async channel

1. **Note:** From here it goes to **Set Rx=Tx, so most parameters track:**

2. Tx Async ESC: 1. P230 compatible, 2. Custom, 3. All avail o/h after Aux

2. Select overhead allocated to ESC circuit (Yes)

(Yes): O/h use 1=TS16= ---, 2=TS32b5&6= ---, (Yes)

↓ More 3=TS32b7&8= ---, 4=TS48= ---, ↓ Help

(↓ More): O/h use 1=TS0b1= ---, 2=TS32b1= ---,

↑ Back 3=TS32b3= ---, 4=TS32b4= --- ↓ Help

(↓ Help): Toggle overhead between Aux/---/ESC

--- = Spare, B/A=Backward Alarm, ↑ ↓ More

(↓ More): MFW=Multi-Frame Word

Cas=Channel Assoc' Signalling ↑ Back

Req.'s IBS Option E

3. Tx ESC Port [Off]: 1. Off, 2. High rate async channel Req.'s IDR bd, + Options F, H, I, & J

1. Sync Aux circuit o/h usage: 1. Maximum, 2. Custom

1. Tx & Rx Aux interface (RS232): 1. RS232, 2. RS422

Note: From here it goes to **Set Rx=Tx, so most parameters track:**

2. Select overhead allocated to Aux circuit (Yes)

(Yes): O/h use 1=TS16=Aux, 2=TS32b5&6=Aux, (Yes)

↓ More 3=TS32b7&8=Aux, 4=TS48=Aux, ↓ Help

(↓ More): O/h use 1=TS0b1=---, 2=TS32b1=Aux,

↑ Back 3=TS32b3=B/A, 4=TS32b4=MFW ↓ Help

(↓ Help): Toggle overhead between Aux/---/ESC

--- = Spare, B/A=Backward Alarm, ↑ ↓ More

MFW=Multi-Frame Word

CAS=Channel Assoc' Signalling

↑ Back

Tx & Rx Aux interface (RS232): 1. RS232, 2. RS422

Note: From here it goes to **Set Rx=Tx, so most parameters track:**

2. Tx Async ESC [Off]: 1. P230 compatible, 2. Custom, 3. All avail o/h after Aux

2. Select overhead allocated between ESC and Aux circuits (Yes)

(Yes): O/h use 1=TS16= ---, 2=TS32b5&6= ---, (Yes)

↓ More 3=TS32b7&8= ---, 4=TS48= ---, ↓ Help

(↓ More): O/h use 1=TS0b1= ---, 2=TS32b1=Aux, (Yes)

↑ Back 3=TS32b3=B/A, 4=TS32b4=MFW ↓ Help

(↓ Help): Toggle overhead between Aux/---/ESC

--- = Spare, B/A=Backward Alarm, ↑ ↓ More

MFW=Multi-Frame Word

CAS=Channel Assoc' Signalling

↑ Back

3. You will get the message :

"Select overhead allocated to Aux circuit, ESC will use all remaining (Yes)".

(Yes): O/h use 1=TS16= ---, 2=TS32b5&6= ---, (Yes)

↓ More 3=TS32b7&8= ---, 4=TS48= ---, ↓ Help

(↓ More): O/h use 1=TS0b1= ---, 2=TS32b1= Aux, (Yes)

↑ Back 3=TS32b3=B/A, 4=TS32b4=MFW Help

(↓ Help): Toggle overhead between Aux/---/ESC

--- = Spare, B/A=Backward Alarm, ↑ ↓ More

MFW=Multi-Frame Word

CAS=Channel Assoc' Signalling

↑ Back

You will then get the message "Max ESC rate is xxxxx Baud, (Yes)

You will then get the message "Async rate: sync=xxxxbps, async<=xxxxBaud" Req.'s IDR bd, + Options F, H, I, & J

"ESC input Baud rate: [xxxx] ↑ ↓ (Yes) _____

(Max continuous rate is xxxxx Baud)"

[Use up /down keys to select Baud rate, and press Yes to accept]

Tx ESC input [8N]: 1. 7, 2. 8, 3. None, 4. Even, 5. Odd

Tx & Rx ESC Interface [RS485]: 1. RS232, 2. RS422, 3. RS485, 4. Link to M&C

4. Internal link to M&C port: 1. Local (M&C PC end), 2. Remote end

Tx & Rx Aux interface [RS232]: 1. RS232, 2. RS422

ESC/AUX/BA; [IDR], & [Custom – IDR]:

IDR 8k ESC: 1. Off, 2. Sync, 3. Async Req.'s ESC Option G

1. Tx Aux Circuit [Off]: 1. Off (normal), 2. 64k in V1&2, 3. 32k in V1, 4. 32k in V2

1. **Note:** From here it goes back to **Tx input Levels:**

2.-4. Tx & Rx Aux interface: 1. RS232, 2. RS422

Req.'s IDR bd + Options F, H, & J

Note: From here it goes to **Tx input Levels:**

2. Tx Aux Circuit [Off]: 1. Off (normal), 2. 64k in V1&2, 3. 32k in V1, 4. 32k in V2

1. Tx & Rx ESC interface(RS485): 1. RS232, 2. RS422, 3. RS485, 4. Link to M&C

4. Internal link to M&C port: 1. Local (M&C PC end), 2. Remote end

Note: From here it goes to **Tx input Levels:**

2.-4. Tx & Rx ESC interface (RS485): 1. RS232, 2. RS422, 3. RS485, 4. Link to M&C

4. Internal link to M&C port: 1. Local (M&C PC end), 2. Remote end

Tx & Rx Aux interface (RS232): 1. RS232, 2. RS422

Note: From here it goes to **Tx input Levels:**

3. Tx Aux Circuit [Off]: 1. Off (normal), 2. 64k in V1&2, 3. 32k in V1, 4. 32k in V2

1. ESC input Baud rate: [xxxx] (Yes) _____

(Max continuous rate is xxxxx Baud)

[Use up /down keys to select Baud rate, and press Yes to accept]

Tx ESC input (8N): 1. 7, 2. 8, 3. None, 4. Even, 5. Odd

Tx & Rx ESC Interface (RS485): 1. RS232, 2. RS422, 3. RS485, 4. Link to M&C

4. Internal link to M&C port: 1. Local (M&C PC end), 2. Remote end

Note: From here it goes to **Tx input Levels:**

2.-4. ESC input Baud rate: [xxxx] (Yes) _____

(Max continuous rate is xxxxx Baud)"

[Use up /down keys to select Baud rate, and press Yes to accept]

Tx ESC input (8N): 1. 7, 2. 8, 3. None, 4. Even, 5. Odd

Tx & Rx ESC Interface(RS485): 1. RS232, 2. RS422

Tx & Rx Aux Interface (RS232): 1. RS232, 2. RS422

Note: From here it goes to **Tx input Levels:**

Req.'s IDR bd + Options F, G, H, I, & J

Tx input levels(V1=0.0, V2=0.0): V1=x.x, V2=x.x dBm, Press 1. V1, 2. V2, then Yes to fix (accept)

[Enter values you set for V1: _____, and V2: _____]

Back' Alm 1234 (EEEE): E=Ext A=Auto O=OK, 1. EEEE, 2. AEEE, 3. AOOO, 4. AAAA

Set Rx=Tx, so most Rx parameters track Tx [Off]: 1. Off, 2. On (recommended)

Refer to: P300 Installation and Operating Handbook, section 6.7 "Change, RX menu" for more details.

Note: This document will take the position that you selected Rx=Tx=On.

Insert Bearer [Loop]: 1. Loop Terr (normal), 2. Generate in modem

Req.'s ESC Option G

Refer to: P300 Installation and Operating Handbook, section 6.7.2 "Change, Rx, BASEBAND Menu" for more details.

Note: This only appears when Closed+ESC, IBS/SMS, or IDR service mode and Drop Mux under Tx baseband is chosen.

Note: "Loop Terr" is for inserting the data received from the 'sat onto the existing T1 or E1 bearer at the remote end.

"Generate in modem" is for inserting the data received from the 'sat onto a T1 or E1 bearer generated by the modem and fed to external equipment.

1. & 2. Insert TS: _____ Toggle: ??-?? (Yes) Help _____ [Enter desired timeslots]

(Help): eg enter 4 to toggle TS4, enter 1317 to toggle TS13-17

Station clock connection [None]:

Refer to: P300 Installation and Operating Handbook, section 6.7.4 "Change, Rx, Buffer/Clocking, STATION CLOCK Menu" for more details.

Station clock connection: 1. None, 2. Via BNC, 3. RS422 on D type

2. & 3. Station clock frequency: [00000]kHz (1-10Mhz) ?????? _____ [Enter desired frequency]

Note: If you selected 10,000kHz (10MHz) as the station clock frequency, you will see the following menu:

Use station clock as IF synth ref (No): 1. No, use normal int' ref, 2. Yes READ

(Read): PHASE NOISE & STABILITY of station clock CRITICAL if used as ref for IF synth

Rx Clocking:

Refer to: P300 I&O Handbook, section 6.7.5 “Change, Rx, Buffer/Clocking, RX CLOCK Menu”, and section 6.7.6 “Change, Rx, Buffer/Clocking, BUFFER SIZE Menu” for more details. Also refer to Pg 7.

Note: This menu differs depending on whether you chose Continuous or Drop Mux from the Tx baseband menu. Both are shown for your convenience, disregard the BB mode you aren't using.

Note: The preferred method for single clock timing across a link using two Paradise modems is as follows:

With continuous baseband the modem *supplying* the clock is set to either Internal or Tx Clock In (if the external equipment is supplying a clock), and the second modem that is to *loop the clock back* is set to Tx Clock = Rx ref (Sat).

With G703 Interface using Drop & Insert baseband mode, set the first modem that is to send the clock (obtained from the bearer clock supplied to it's terrestrial interface) to Insert Mux – Loop Terr. and the Backup Bearer Clock Source - Sat. (the backup bearer clock source in case the terrestrial Tx clock fails, which in turn will keep the Sat link clock operating and keep the link up).

If the external equipment is expecting a full T1/E1 to be supplied by the modem, and it loops the clock back to the modem's Tx clock input, set the second modem to Insert Mux – Generate In Modem - Sat (recommended) or Int. This will insert the data received from the satellite onto a bearer *to be generated* by the second modem (using the received clock from the satellite or Int. clock as selcted). This will then feed a Full T1 or E1 bearer (with data) from the second modem to any external equipment, and use the same clock it receives as it's Tx clock across the Sat link, making it a single clock across the Sat. link.

If the external equipment is supplying a full T1 or E1 bearer, set the second modem to Insert Mux – Loop Terr. and Backup Bearer Clock Source – Sat or Int. (the backup bearer clock source in case the terrestrial Tx clock fails, which in turn will keep the Sat link clock operating and keep the link up). This will insert the data from the satellite onto an *existing* T1 or E1 bearer. Note: If you have external equipment supplying full T1 or E1 bearers at both ends of the link, you cannot have a single clock across a Sat. link.

For examples of both of these types of D&I Rx clocking, refer to Example 1 on page 7.

Closed Network, Closed Network+ESC, IBS/SMS, IDR, or Custom Service w/ Continuous Tx Baseband:

Rx output clk source [Sat]: 1. Sat (recommended), 2. Tx, 3. Internal

Closed Network, Closed Network+ESC, IBS/SMS, or IDR Service w/ Drop&Insert Tx Baseband:

Note: Only one of these two choices appears when you choose “Insert bearer” :

- 1. “Backup bearer clk source” appears if you chose “Loop Terr “ under “Insert Bearer”, Req.'s Option C. or
- 2. “Generated bearer clk source” appears if you chose “Generate in modem” under “Insert Bearer”.

Backup bearer clk source [Sat]: 1. Sat (recommended), 2. Internal

[Note; If Sat clock fails, modem will switch to Internal clock automatically]

1. & 2. Buffer Size (end-end): [xx]mS (Yes) _____

[Enter Desired buffer size in milliseconds, then press Yes]

Generated bearer clk source [Sat]: 1. Sat (recommended), 2. Tx, 3. Internal

2. & 3. Buffer Size (end-end): [xx]mS (Yes) _____

[Enter Desired buffer size in milliseconds, then press Yes]

Set downconverter freq shift to display/edit Rx freq at antenna [No]: 1. Yes 2. No

1. Freq shift of downconverter (0):

(0-65535MHz) ?????? (Yes) _____

[Enter desired freq shift]

Rx Antenna frequenc [xxxxx.xxxxMHz]:

?????.????? (Yes) ↓ IF/SHF+Limits _____

[Enter desired freq shift limits]

Rx Range (xxxxx...xxxxxMHz): (Step 100Hz):

(inc D/C shift of xxxxxMHz) ↑

Note: From here it goes back to **Demod Sweep Range:**.

Set Rx IF Frequency [70.0000MHz]: ????.????? _____

[Enter desired Frequency for Rx]

Refer to: P300 Installation & Operating Handbook, section 6.6.9 “Change, Tx/Rx, Modulator, IF FREQUENCY Menu” for more details.

Demod sweep range [Auto]: 1. Auto (=+/-25kHz)(preferred), 2. User

Refer to: P300 Installation & Operating Handbook, section 6.7.15 “Change, Rx, Demod, SWEEP Menu” for more details.

2. Set user demod sweep: ?? _____

[Enter desired sweep range (1-32kHz)]

Report Eb/No for distant end AUPC [Off]: 1. Off, 2. On Req.'s Option Z + G
Refer to: P300 Installation and Operating Handbook, sections 6.6.14 "Change, Rx, Demod, AUPC Menu", and section 8.11 "Introduction to AUPC" for more details on AUPC.

Rx output levels [V1=0.0, V2=0.0]: V1=x.x, V2=x.x dbm, Press 1. V1, 2. V2, then \uparrow \downarrow , Yes to fix (accept)
[Enter value for V1 _____, V2 _____] Req.'s IDR bd + ESC Option G

Set electrical interface : 1. V.35, 2. RS422, 3. RS232, 4. G.703 Req.'s G.703 bd Option T1 or E1
Refer to: P300 I & O Handbook, section 6.8.1 "Change, Terr-Intfc, Electrical Menu" for more details.

4. Set G.703 line code (HDB3): 1. AMI, (E1) 2. HDB3 (Normal) Req.'s G.703 bd Option T1 or E1
1. AMI, (T1) 2. B8ZS (Normal)
2. (T1) Set T1 line length: 1. <=133', 2. <=266', 3. <=399', 4. <=655'

Note: the following menu will only appear if the modem has been configured before, and is not using G.703 Intf.:

Interface Control Lines [Ignore]: 1. Ignore all, 2. Active-configure
2. (V.35): Line "DTR" (DTE Ready In): 1. Ignore, 2. Active
(RS422): Line "TR" (DTE Ready In): 1. Ignore, 2. Active
(RS232): Line "CD" (DTE Ready In): 1. Ignore, 2. Active

(V.35): Line "RTS" (Tx input signal valid): 1. Ignore, 2. Active
(RS422): Line "RS" (Tx input signal valid): 1. Ignore, 2. Active
(RS232): Line "CA" (Tx input signal valid): 1. Ignore, 2. Active

Optional parameters: 1. Configure, 2. Skip, 3. Set to normal & skip (preferred)
1. Deferred alarm when final BER> (1.0E-04): (1.0E-1 to 9.9E-15, 0=Off) ??E-?? _____ Yes
[Enter desired final BER]
Deferred alarm when Eb/No<(None): (0.1 to 25.5dB, 0=Off) ??? _____ Yes
[Enter desired Eb/No]
Deferred alarm if slips<(None) Hrs apart: (1-0000, 0=Off) ???Hrs _____ Yes
[Enter desired hours]
Center buffer on Rx path change from fail to OK (Yes): 1. Yes (normal), 2. No
Action when BER>1E-3 (AIS): 1. None, 2. Force AIS & Send BA
Action when AIS detected (Prompt): 1. Ignore, 2. Prompt Alm & Send BA & AIS
Rx Final BER mon: Set: Atuo USING: FEC: 1. Auto, 2. FAW, 3. FEC
Tx & Rx IF Impedance (50 Ohm): 1. 50 Ohm, 2. 75 Ohm
Default status display of (Traffic): 1. Traffic, 2. Config Summary
Current time: ??:??:?? [Enter new time (hr:min:sec, military time format) _____]
Current date: ??/??/?? [Enter new date (day/month/year) _____]

Remote M&C Protocol [Off]: 1. Off, 2. Paradise/FDC, 3. SA-Bus
Refer to: P300 I & O Handbook, section 6.9-6.9.2 that deal with remote M&C for more details.
2.-3. Remote M&C Interface [RS485]: 1. RS232, 2. RS485
Remote M&C Baud Rate [2400]: _____ Scroll with \uparrow \downarrow Yes to set
[Select desired Baud rate]
Remote M&C Address: ??? _____
[Enter desired address (0-255)]

Setup Complete ! Press MAIN for menu or YES for status (preferred)

-End of Blank Form-

6. Appendix A: Feature Code Option Listing

OPTIONS:	Options- In Use	Options- Factory Installed	Description of options
A*	X	X	Tx path: without this the modem can be Rx only
B*	X	X	Rx path: without this the modem can be Tx only
C			Basic Drop/Insert: T1/E1 operation, linear TS, excludes 'Odd values of N'
D			Advanced D/I: adds E1 CAS & T1 RBS, support for 'Odd values of N' so N=1 to 31 inclusive, Partial insert (multi-destinational working), and G732 0% overhead mode in IBS
E			IBS: IBS framing at all rates
F^			IDR: IDR framing at all rates (8kbps multiples, limited by IDR frame structure)
G			ESC: High rate IBS Async ESC. IDR Async ESC
H^			Aux.: IBS Sync Aux. Port, IDR 32/64kbps in place of ADPCM
I			Custom features: Arbitrary 'n' & 'k' when using Reed-Solomon, Custom and Minimum Overhead framing modes, Custom allocation of IBS o/h between Async ESC & Sync Aux. ports,
J^			P1348 emulation: Emulation of P1348/P1448 cards popular in SNG applications. Includes generation of 64kbps carrier from 2 x 32k ADPCM audio(using IDR Audio ESC ports), or 128kbps from 2x Audio + 64kbps data.
K			PRBS tester: Internal BERT (can run through Main, ESC and Aux. Channels)
L			Intelsat Reed-Solomon: Intelsat standard, unless Custom Features option enabled giving variable code rate.
M			Sequential codec (only available if hardware option fitted)
N*	X	X	Viterbi codec (only available if hardware option fitted)
O			8PSK/ Trellis Code Modulation
P*	X	X	Variable Data Rate
Q*	X	X	Dual rate: It data rate is fixed by option 'P', then fixed at Low_Rate unless this option enabled when choice of Low_Rate or High_Rate is available. No effect if option 'P' enables Variable rate.
R			Variable, Full range: If data rate is Variable by option 'P' , then the data rate range is full range of hardware if this option enabled, otherwise limited to rates between Low_Rate and High_rate.
S*	X	X	70MHz IF interface: IF frequencies in the range 50 - 90 MHz
T			Wideband IF interface: IF frequencies in the range 50 - 180 MHz
U*	X	X	100 Hz IF synth steps: 2.5 kHz if not enabled
V*	X	X	Misc. ASIC functions
W			Turbo (TPC) / Sequential
X*	X	X	Spare 2
Y			Spare 3
Z			Auto Uplink Power Control
T1			1544kbps G.703 interface in addition to RS422/ V.35/ RS232 interface
E1			2048kbps G.703 interface in addition to RS422/ V.35/ RS232 interface
AGC			Monitor/AGC: Demod Rx carrier signal level monitor, 0-10 volt Analog output of carrier signal level, Eb/No, or Rx offset frequency, Constellation monitor port.
IDR			Q301 IDR Board, Options denoted by ^ are required for this hardware option.
NOTES:			* Denotes the "standard P300 Modem"
			^ Denotes options that are grouped together on the IDR option 'F'.
			Options: F, H, J, M, W, G.703-E1, G.703-T1 and AGC require option boards to be added to the P300.
			All other Options are software selected.

- End of Appendix A -

7. Appendix B: EIA-530 Pinout & Adapters

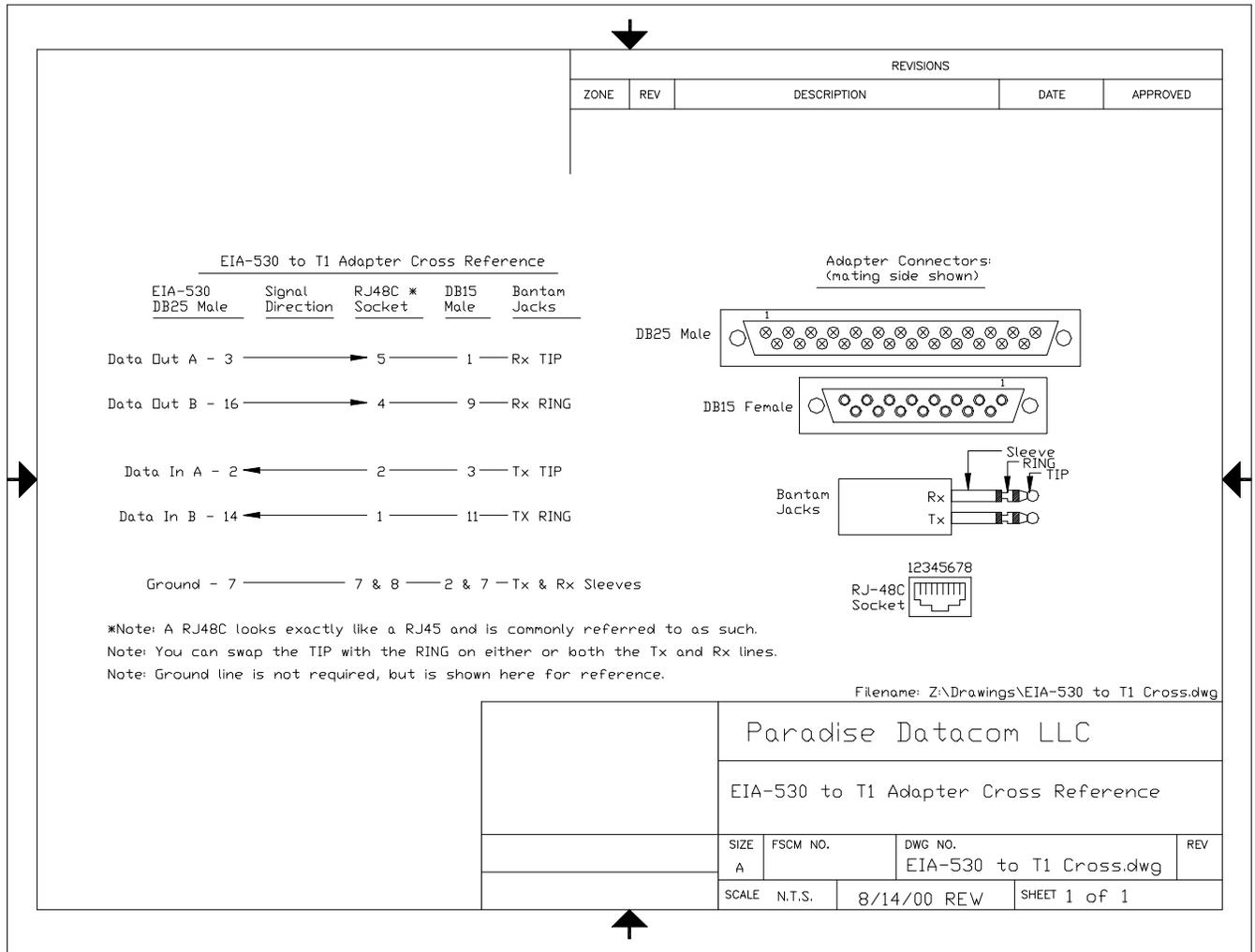
EIA-530 to V.35 Winchester Cable (P300 DCE to external DTE or DCE device):

* = Minimum signals required by modem. ** = Recommended that you do not connect these pins!								
Paradise P300 EIA-530 DCE			V.35 DTE Device (straight through cable)			V.35 DCE Device (crossover cable)		
Standard Signal Description Paradise Signal Description	DB25 Male	To/From Modem	Winchester Female	CCITT V.35 Name	Signal Description	Winchester Female	CCITT V.35 Name	Signal Description
Clear To Send (A), Sig Valid In	5	From	D	CTS (A)	Clear To Send	-----	-----	Signal Not Used in DCE-DCE
Clear To Send (B), Sig Valid In	13	-----	-----	-----	Signal Not Used in V.35	-----	-----	Signal Not Used in V.35
Data Set Ready (A), Device (DCE) Ready Out	6	From	E	DSR (A)	Data Set Ready	H	DTR	Data Terminal Ready (A)
Data Set Ready (B), Device (DCE) Ready Out	22	-----	-----	-----	Signal Not Used in V.35	-----	-----	Signal Not Used in V.35
Data Terminal Ready (A), Device (DTE) Ready In	20	To	H	DTR (A)	Data Terminal Ready	E	DSR	Data Set Ready (A)
Data Terminal Ready (B), Device (DTE) Ready In	23	-----	-----	-----	Signal Not Used in V.35	-----	-----	Signal Not Used in V.35
Request To Send (A), Signal Valid In	4	To	C	RTS (A)	Request To Send	F	RSLD	Rx'd Line Signal Detector (A)
Request To Send (B), Signal Valid In	19	-----	-----	-----	Signal Not Used in V.35	-----	-----	Signal Not Used in V.35
Rx Clock (A), Clock In	* 24	To	U	SCTE (A)	Serial Clock Tx Ext A	V	SCR A	Serial Clock Rx A
Rx Clock (B), Clock In	* 11	To	W	SCTE (B)	Serial Clock Tx Ext B	X	SCR B	Serial Clock Rx B
Rx Data (A), Data In	* 2	To	P	SD (A)	Send Data A	R	RD (A)	Rx Data A
Rx Data (B), Data In	* 14	To	S	SD (B)	Send Data B	T	RD (B)	Rx Data B
Rx'd Line Signal Detector (A), Signal Valid Out	8	From	F	RSLD (A)	Rx'd Line Signal Detector	C	RTS	Request To Send (A)
Rx'd Line Signal Detector (B), Signal Valid Out	10	-----	-----	-----	Signal Not Used in V.35	-----	-----	Signal Not Used in V.35
Serial Clock Tx (A), Int Tx Clock Out	15	From	Y	SCT (A)	Serial Clock Tx A	-----	-----	Signal Not Used in DCE-DCE
Serial Clock Tx (B), Int Tx Clock Out	12	From	AA	SCT (B)	Serial Clock Tx B	-----	-----	Signal Not Used in DCE-DCE
Shield	1	-----	A	FG	Frame Ground	A	FG	Frame Ground
Signal Ground	* 7	-----	B	SG	Signal Ground	B	SG	Signal Ground
Tx Clock (A), Clock Out	* 17	From	V	SCR A	Serial Clock Rx A	U	SCTE (A)	Serial Clock Tx Ext A
Tx Clock (B), Clock Out	* 9	From	X	SCR B	Serial Clock Rx B	W	SCTE (B)	Serial Clock Tx Ext B
Tx Data (A), Data Out	* 3	From	R	RD (A)	Rx Data A	P	SD (A)	Send Data A
Tx Data (B), Data Out	* 16	From	T	RD (B)	Rx Data B	S	SD (B)	Send Data B
Remote Loop In **	** 21	To	** BB	RL	Remote Loop	** BB	RL	Remote Loop
Local Loop In **	** 18	To	** J	LL	Local Loop	** J	LL	Local Loop

Black Box Items of interest concerning V35 cabling (www.blackbox.com):

- **EIA-530 (M) to V.35 (F) molded adapter:** # FA058. *Highly recommended!*
These are inexpensive (compared to building one yourself) at \$20 each.
Please note: If you use a BlackBox #FA058 adapter on the EIA-530 connector of the P300, you should not select electrical interface signal type RS422, as the adapter omits the "B" side of all the control lines, since V35 doesn't require them. This will cause external data equipment configured for RS422 to not handshake properly with the modem. If you wish to use the EIA-530 connector with RS422 electrical signals, do not use the adapter & use an appropriate EIA-530 to external equipment cable (example: Cisco CAB-530MT), or better yet use the modem's RS449 37D connector.
- **V.35 Gender Changers:** # FA052 (M-M) \$40, # FA054 (F-F) \$44.
- **EIA-530 (M) to EIA-530 (F) cable:** # EVN530-xxxx-MF (xxxx = length from 5' to 200')(MF= Male to Female). Price varies with length, 5' = \$39. They also have M-M and F-F cables.
- **V.35 (M) to V.35 (F) cable:**
 1. Standard cables: # EYN450-xxxx-MF (xxxx= length from 3' to 25'). MF= Male to Female (Note: They also have M-M and F-F cables). Price varies with length, 3' = \$74.
 2. Economy Molded cables: # BCO45xx-MF (xx= length from 3' to 25'). MF= Male to Female (Note: They also have M-M and F-F cables). Price varies with length, 3' = \$55.

EIA-530 to T1 Adapter (Cross Reference):



EIA-530 to E1 Adapter (if required):

Two 75 Ohm BNC's are supplied with the G.703 E1 option. The "In" BNC is the incoming signal from the external equipment, and the "Out" BNC is the signal from the modem to the external equipment.

If you choose to use the EIA-530 DB25 Female connector (120 Ohm) then an adapter pinout would be as shown below. All modems are shipped with the switches set to use the BNC's & no 1:1.

Note: If using the EIA-530 DB25 connector instead of the BNC's, you must remove the modem's cover, remove the G.703 option board, and throw switch SW2 to position 2 (120 Ohm operation, see P300 handbook, Appendix A, "P1440 In G.703 Mode").

Note: If using the modem in a 1:1 configuration, you must remove the modem's cover, remove the G.703 option board, and throw switch SW1 to position 2 (1:1 operation, see P300 handbook, Appendix A, "P1440 In G.703 Mode").

Note: You can change the "Out" BNC shield to "Float" with LK1 (1-2=Grd (shipped), 2-3=Float).

Data In	2 (Data In A)	14 (Data In B)
Data Out	3 (Data Out A)	16 (data Out B)
Ground / Shield	7 (Ground)	1 (Shield)

EIA-530 to RS449:

EIA-530 to RS449 Cable (P300 DCE to external DTE or DCE device):									
* = Minimum signals required by modem. ** = Recommended that you do not connect these pins!									
Paradise P300 EIA-530 DCE			RS449 DTE Device (straight through cable)				RS449 DCE Device (crossover cable)		
Standard Signal Description Paradise Signal Description	DB25 Male	To/From Modem	DB37 Fem	RS-449 Name	Standard Signal Description	DB37 Fem	RS-449 Name	Standard Signal Description	
Clear To Send (A), Sig Acct' d Out	5	From	9	CTS (A)	Clear To Send (A)	-----	-----	Signal Not Used for DCE-DCE	
Clear To Send (B), Sig Acct' d Out	13	From	27	CTS (B)	Clear To Send (B)	-----	-----	Signal Not Used for DCE-DCE	
Data Set Ready (A), Device (DCE) Ready Out	6	From	11	DM (A)	Data Set Ready (A)	12	TR (A)	Data Terminal Ready (A)	
Data Set Ready (B), Device (DCE) Ready Out	22	From	29	DM (B)	Data Set Ready (B)	30	TR (B)	Data Terminal Ready (B)	
Receive Timing (A), Clock Out	*17	From	8	RT (A)	Receive Timing (A)	17	TT (A)	Terminal Timing (A)	
Receive Timing (B), Clock Out	*9	From	26	RT (B)	Receive Timing (B)	35	TT (B)	Terminal Timing (B)	
Receiver Ready (A), Sig Valid Out	8	From	13	RR (A)	Receiver Ready (A)	7	RTS (A)	Request To Send (A)	
Receiver Ready (B), Sig Valid Out	10	From	31	RR (B)	Receiver Ready (B)	25	RTS (B)	Request To Send (B)	
Request To Send (A), Sig Valid In	4	To	7	RTS (A)	Request To Send (A)	13	RR	Receiver Ready (A)	
Request To Send (B), Sig Valid In	19	To	25	RTS (B)	Request To Send (B)	31	RR	Receiver Ready (B)	
Send Data (A), Data In	*2	To	4	SD (A)	Send Data (A)	6	RD (A)	Rx Data (A)	
Send Data (B), Data In	*14	To	22	SD (B)	Send Data (B)	24	RD (B)	Rx Data (B)	
Send Timing (A), Int Tx Clk Out	15	From	5	ST (A)	Send Timing (A)	-----	-----	Signal Not Used for DCE-DCE	
Send Timing (B), Int Tx Clk Out	12	From	23	ST (B)	Send Timing (B)	-----	-----	Signal Not Used for DCE-DCE	
Shield	*1	-----	1	FG	Shield	1	FG	Shield	
Signal Ground	*7	-----	19	SG	Signal Ground	19	SG	Signal Ground	
Data Term. Ready (A), Device (DTE) Ready In	20	To	12	TR (A)	Terminal Ready (A)	11	DM (A)	Data Set Ready (A)	
Data Term. Ready (B), Device (DTE) Ready In	23	To	30	TR (B)	Terminal Ready (B)	29	DM (B)	Data Set Ready (B)	
Terminal Timing (A), Clock In	*24	To	17	TT (A)	Terminal Timing (A)	8	RT (A)	Receive Timing (A)	
Terminal Timing (B), Clock In	*11	To	35	TT (B)	Terminal Timing (B)	26	RT (B)	Receive Timing (B)	
Rx Data (A), Data Out	*3	From	6	RD (A)	Rx Data (A)	4	SD (A)	Send Data (A)	
Rx Data (B), Data Out	*16	From	24	RD (B)	Rx Data (B)	22	SD (B)	Send Data (B)	
Local Loop In **	**18	To	-----	LL	Local Loop	-----	LL	Local Loop	
Remote Loop In **	**21	To	-----	RL	Remote Loop	-----	RL	Remote Loop	

- End of Appendix B -

Appendix C: RS449 Pinout

RS449:

For RS422 use, the RS449 DB37 Female connector on the back of the modem is already pinned correctly for this type of electrical standard – no physical adapter required! For connecting to a DTE device it's simply a one to one pinout cable. For connecting to a DCE device, a null modem cable is required (see below for both types).

RS449 to RS449 Cable (P300 DCE to external DTE or DCE device):								
* = Minimum signals required by modem. ** = Recommended that you do not connect these pins!								
Paradise P300 RS449 DCE			RS449 DTE Device (straight through cable)			RS449 DCE Device (crossover)		
Standard Signal Description Paradise Signal Description	DB37 Male	To/From Modem	DB37 Fem	RS-449 Name	Standard Signal Description	DB37 Fem	RS-449 Name	Standard Signal Description
Clear To Send (A), Sig Acct'ed Out	9	From	9	CTS (A)	Clear To Send (A)	-----	-----	Signal Not Used for DCE-DCE
Clear To Send (B), Sig Acct'ed Out	27	From	27	CTS (B)	Clear To Send (B)	-----	-----	Signal Not Used for DCE-DCE
Data Set Ready (A), Device (DCE) Ready Out	11	From	11	DM (A)	Data Set Ready (A)	12	TR (A)	Data Terminal Ready (A)
Data Set Ready (B), Device (DCE) Ready Out	29	From	29	DM (B)	Data Set Ready (B)	30	TR (B)	Data Terminal Ready (B)
Receive Timing (A), Clock Out	*8	From	8	RT (A)	Receive Timing (A)	17	TT (A)	Terminal Timing (A)
Receive Timing (B), Clock Out	*26	From	26	RT (B)	Receive Timing (B)	35	TT (B)	Terminal Timing (B)
Receiver Ready (A), Sig Valid Out	13	From	13	RR (A)	Receiver Ready (A)	7	RTS (A)	Request To Send (A)
Receiver Ready (B), Sig Valid Out	31	From	31	RR (B)	Receiver Ready (B)	25	RTS (B)	Request To Send (B)
Request To Send (A), Sig Valid In	7	To	7	RTS (A)	Request To Send (A)	13	RR	Receiver Ready (A)
Request To Send (B), Sig Valid In	25	To	25	RTS (B)	Request To Send (B)	31	RR	Receiver Ready (B)
Send Data (A), Data In	*4	To	4	SD (A)	Send Data (A)	6	RD (A)	Rx Data (A)
Send Data (B), Data In	*22	To	22	SD (B)	Send Data (B)	24	RD (B)	Rx Data (B)
Send Timing (A), Int Tx Clk Out	5	From	5	ST (A)	Send Timing (A)	-----	-----	Signal Not Used for DCE-DCE
Send Timing (B), Int Tx Clk Out	23	From	23	ST (B)	Send Timing (B)	-----	-----	Signal Not Used for DCE-DCE
Shield	*1	-----	1	FG	Shield	1	FG	Shield
Signal Ground	*19	-----	19	SG	Signal Ground	19	SG	Signal Ground
Data Term. Ready (A), Device (DTE) Ready In	12	To	12	TR (A)	Terminal Ready (A)	11	DM (A)	Data Set Ready (A)
Data Term. Ready (B), Device (DTE) Ready In	30	To	30	TR (B)	Terminal Ready (B)	29	DM (B)	Data Set Ready (B)
Terminal Timing (A), Clock In	*17	To	17	TT (A)	Terminal Timing (A)	8	RT (A)	Receive Timing (A)
Terminal Timing (B), Clock In	*35	To	35	TT (B)	Terminal Timing (B)	26	RT (B)	Receive Timing (B)
Rx Data (A), Data Out	*6	From	6	RD (A)	Rx Data (A)	4	SD (A)	Send Data (A)
Rx Data (B), Data Out	*24	From	24	RD (B)	Rx Data (B)	22	SD (B)	Send Data (B)
Local Loop In **	**10	To	-----	LL	Local Loop	-----	LL	Local Loop
Remote Loop In **	**14	To	-----	RL	Remote Loop	-----	RL	Remote Loop

- End of Appendix C -